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Analysis of Quality and Cost Measures and Display for the MyHealthCareOptions Website

Prepared by

Massachusetts Health Quality Partners

for

The Commonwealth of Massachusetts Health Care Quality and Cost Council

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Task 1 Final Report

This document is was prepared in accordance with the terms and conditions provided in the Subcontractor Agreement between
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Contents

Executive Summary

This report is a review of the work completed on the first task required under the Massachusetts Health Care Quality and Cost Council (QCC) contract with Massachusetts Health Quality Partners (MHQP) and its partner, the Milliman Corporation. The overall purpose of this work is to review the quality and cost measures included in the QCC's 2008 Reporting Plan and the display of the measures selected from that plan on the QCC's website. In addition we include a section on overall methodological issues and recommendations of particular importance to the clear and accurate presentation of quality and cost data on the QCC website.

Quality Measures and Disparities

Our extensive review of the quality measures included in the QCC's 2008 reporting plan allowed us to highlight the positive aspects of the quality metrics selected by the QCC and at the same time recommend changes to the measures or measure sources where more current information is available. We also assess the relevance of each measure to an analysis of ethnic and racial disparities in the delivery of health care.

Measures of Hospital Performance

Summary of current measure strengths:

- Most of the quality measures displayed on MyHealthCareOptions reflect nationally endorsed measures that have broad stakeholder support and meet the Quality and Cost Council's Principles for Selecting Quality Measures.
- Most of the surgical procedures are elective, giving consumers an opportunity to seek the type of information displayed on the website. Similarly, most of the medical conditions are chronic, so that consumers can plan ahead by educating themselves about their condition and where the best care may be obtained.
- Several of the procedures are high risk procedures that may prompt more consumers to shop around for the best care available.
- Many of the quality measures are outcome measures, which are preferred by consumers and easier for them to understand. All outcome measures have been risk-adjusted to account for differences in the patient populations treated in different hospitals.

Areas for Improvement:

- The current measure set includes some quality measures that have not received national endorsement.
- Some of the current quality measures do not reflect the highest priority medical conditions or procedures in terms of consumer interest, disease burden, opportunity for quality improvement or cost containment, or reduction of racial/ethnic disparities.
- Several of the surgical procedures have no quality measures and there are no process-of-care measures displayed for any of the specific surgical procedures. For several of these procedures, process measures that have been shown to decrease the likelihood of a complication are publicly reported.
- Alternative sources exist for some of the measures currently displayed on the QCC website that are more comprehensive, more timely, or less costly than those currently used. There are some obvious gaps in the conditions and procedures for which performance data are displayed on the website. Most notably, there are no quality measures of pediatric or maternity care.

Disparities in Hospital Quality of Care

There is an abundance of evidence that racial and ethnic disparities in care delivery exist across a wide range of care settings, conditions and procedures. Almost every condition or procedure currently displayed on the QCC website has some evidence of a disparity at the national level or in the literature. For each opportunity, we have provided an estimate of the level at which either the measures or the providers would need to be aggregated in order to illustrate these disparities. A bundled quality measure may permit analysis of potential disparities at the hospital level, while an individual measure of care may need to be aggregated across hospitals to the community or regional level.

Ambulatory Care Quality Measures

Currently, there are no quality measures for outpatient care on the QCC website. The "fit" between the high volume outpatient procedures for which cost information is displayed and those for which related quality measures are available is poor. Recommendations for enhancing the outpatient care measures of quality available on the website encompass both recommendations for improving the information currently displayed, and adding physician office based ambulatory care quality measures using the National Committee on Quality Assurance (NCQA) HEDIS clinical quality effectiveness measures and Massachusetts Health Quality Partner (MHQP) patient experience measures.

Disparities in Office-based Quality of Care

Because health plans have only begun to collect self-reported data on patients' race and ethnicity, the QCC database from which ambulatory care quality measures may be derived does not currently contain these data. It is likely that it will take years before health plans can provide race and ethnicity data for a sufficient proportion of their members to support stratification of measures like HEDIS by race/ethnicity. Based on the assumption that self-reported data will need to be supplemented for a number of years before a critical mass of data are available to support disparities measurement, recommendations for the types of measures and levels of aggregation that are likely to be necessary to measure quality in the ambulatory setting include the management of chronic disease and preventive care services **at the regional or community level**.

Cost and Utilization Measures

Healthcare cost and utilization data are often viewed as more difficult to interpret and assess when compared to data from other types of transactions involving goods or services. The frequent lack of clarity around definitions of service payment and service units can confuse consumers looking for a simple display of hospital pricing on a website. To aid in understanding the variability of approaches used for displaying healthcare cost and pricing information, the report summarizes some of the key payment and utilization issues and the reporting incentives for the providers, payers and consumers involved in a healthcare transaction.

We found many aspects of the My Healthcare Options website to be as good or better than the practices of other sites, although there are some opportunities for improvement.

Current Positive Features

The My Healthcare Options website exhibits several important strengths in its display of cost information:

- Use of paid claim data (including the patient's copayment amount) rather than billed charge data provides a more meaningful basis for hospital comparisons. Hospital practices for setting charges can vary significantly among hospitals and may bear only limited relationship to prices that hospitals negotiate with insurers, which are often significantly less.

- Explanation of statistical methods for calculations. While many consumers may not have great interest in statistical methods, their publication on the website improves the transparency of the data presented. There is some potential for further improvements in the wording to make the explanations more easily understood by those users interested in this level of detail.

- Risk adjusted hospital comparisons that consider differences in the severity of the medical conditions treated permit more meaningful comparisons among hospitals.

- Side-by-side comparison of data from selected hospitals aids in analyzing differences among healthcare options.

- Specification of a minimum sample size of 30 cases before display of findings supports more appropriate, statistically-significant comparisons.

Short-Term Improvements

Based on our assessment, we recommend one improvement for QCC's attention in the short term:

- In addition to the median price currently provided for comparison purposes, adding cost ranges, such as at the 15^{th} and 85^{th} percentile costs. In some cases, procedure costs will vary considerably and this would help give the consumer greater insight on potential costs.

Longer-Term Improvements

These areas will be addressed in more detail in future reports. Based on this initial review, however, areas worth further consideration include:

- The addition of a capability for users to enter insurance information and receive an estimate of their own expected costs. For example, at the State of New Hampshire consumer site, after selecting a procedure, visitors are directed to a webpage in which they enter demographic information, the name of their insurance carrier, coverage type (HMO, PPO, etc.), deductible, and copayment requirements. The website then provides an estimate of likely out-of-pocket costs.

- Explore the legal and regulatory issues relative to the addition of self-insured employer and multi-employer claims to the database. Adding these populations should significantly increase the robustness of the data which now only includes commercial fully-insured paid claims.

- Comparison of the Massachusetts hospital paid claim levels to benchmarks based on national data and also, possibly, to Medicare rates. This would allow consumers to better understand the significance of high or low costs of Massachusetts hospitals within a broader context. For example, a consumer may find it valuable to know that a local hospital is well within expected cost ranges given costs for hospital care nationally, even if its costs might appear significantly different than other local hospitals.

- The addition of average length of stay information to permit consumers to better assess differences among provider alternatives.

- More sophisticated analytical tools to enable consumers, providers, employers, or other stakeholders to "drill down" further into the components of expected costs and comparisons among alternative providers. In addition, such tools could permit users to switch views of findings between table and graphical displays depending on how they are best able to assess alternatives.

- The inclusion of cost information for treatment modalities other than hospital care such as physician services and prescription drugs. The use of episode groupers could help support cost comparisons in these areas.

- Identification and pricing of treatment alternatives that may address the same medical need. For example, treatment of a specific condition may have pharmaceutical and surgical options. QCC would need to carefully explain how the consumer should consider the results provided through this feature to avoid the appearance of offering medical advice.

Review Council's Existing Website Display

MHQP and its consultants have extensive experience in designing, developing and implementing websites containing health care quality and patient experience information targeted to consumers. The team reviewed over 100 websites, using an evaluation tool drawn

from our own experience as well as with criteria from articles and papers focused on best practices for reporting useful quality information to consumers.

What works well on the MyHealthCareOptions website

The report highlights what works well on the QCC website as well as what works less well. We found that much of the current website works well. The MyHealthCareOptions site has incorporated many of the items that experts recommend and has included some details that are very useful and not found on most other sites. For example, the Welcome Page uses attractive colors and images and lists several reasons why consumers should look at this site. Importantly, the site reports on both cost and quality results where both exist and provides details on how the measures were constructed, including statistical information. It also notes whether a high or low score means better performance and gives other details that can help the consumer understand the costs displayed, including the number of patients and severity of illness for a given hospital.

What works less well on the MyHealthCareOptions website

While there is much to recommend in the MyHealthCareOptions website, as with all websites, there is always room for improvement. Often an outside evaluation can bring up areas of improvement that might not be obvious to those working so closely on the site and provide further evidence to support changes and improvements which the original designers wish to implement. In the report that follows we have presented some of the major changes that we would recommend, along with examples from the QCC's site and other health care sites that illustrate the recommendation.

Some of our recommendations include:

- Adding a section on "what is quality" and "what is cost"
- Being clear on what summary scores represent
- Fixing inconsistency between symbols and language around statistical significance
- Allowing users to create a complete report about a hospital's performance
- Adding tools that allow easier navigation of the site.

Methodological Issues and Recommendations Relevant to the QCC Website

Over the course of our review of the current QCC website, analysts at MHQP and Milliman have noted five methodological approaches of particular importance to the clear and accurate presentation of quality and cost data. The issues we reviewed include the following:

- Use of Mean or Median to Compare Cost Results
- Minimum Sample Size for Reporting a Measure on Website
- Benchmarks for Quality and Cost Measures
- Methods for Calculating Summary Measures for Quality
- Displaying Rankings vs. Statistical Significance on Website Summary Page

A summary of our recommendations on each issue is presented here. In the report that follows we provide a list of advantages and disadvantages to each of these recommendations.

I. ISSUES WHERE WE CONCUR WITH THE QCC METHODS

A. Use of Mean or Median to Compare Cost Results

Providers, in most cases, receive a range of payments for a given procedure. It is therefore helpful to determine a specific cost point that can be used to compare one provider's costs to other selected providers and/or to a statewide benchmark. Both means and medians can be good statistics to use in this case.

- ***We are recommending the QCC continue to use medians.***
    - Medians minimize bias related to data base anomalies and outliers since they are less influenced by a small number of data points.
    - Medians also are more helpful to consumers because they are more likely than mean values to approximate the dollars associated with a typical paid claim.
    - Consumers can readily understand the notion that half of the claim paid amounts will be lower and half will be higher than the displayed amount.

B. Minimum Sample Size for Reporting a Measure on Website

Using an accepted minimum sample size for reporting results helps to ensure that the results will reliably represent the performance of a provider and distinguish real differences in performances among providers. The ideal minimum reliable sample size can vary based on numerous issues.

- ***We recommend that the QCC continue with its current decision to establish a minimum sample size specific to each measure set, using a recognized conventional minimum where one exists***.

II. ISSUES WHERE WE CONCUR WITH THE QCC'S METHODS BUT RECOMMEND EXPANSION

A. Benchmarks for Quality and Cost Measures

Benchmarks provide a reference to help the consumer assess the quality or cost of a particular provider beyond direct comparisons with other individual providers.

- ***We recommend the use of at least two benchmarks for both quality and cost measures***.
    - For quality we recommend the QCC continue to use one benchmark based on the average of all of the results for the entire Massachusetts population included in a given measure and add one benchmark based on the 85th percentile score within the state. Ideally a third external benchmark, such as a national or New England regional rate, should be included if it is available.
    - For cost measures we recommend the QCC continue to use the statewide median provider cost and a within-state regional provider-level median cost, where possible. A national rate also should be included if appropriate.

B. Methods for Calculating Summary Measures for Quality

There are a wide variety of methods that can be used to summarize results on individual quality measures in order to form a broader statement about the performance of a given provider.

- ***We recommend that the QCC continue to use the Summary Compliance Rates (sum of component measure numerators/sum of component measure denominators) for the data currently on the QCC website.***
    - The Summary Compliance Rate is referred to as the "Opportunities" approach and is used by The Joint Commission and CMS.
    - In addition to being used by several national sources, the method is transparent and easily understood. While missing data can affect Summary Compliance Rates, the current hospital measures have little missing data.
- ***For a few specific areas of measurement, where all applicable services are clearly rendered to the same patient in the same facility for the same condition or procedure, we recommend the use of the percent of patients in compliance on all applicable measures as the preferred method***.

III. METHODOLOGICAL ISSUE WHERE WE RECOMMEND REVISIONS

A. Displaying Rankings vs. Statistical Significance on Website Summary Page

Options for displaying summary results include the use of rankings and/or statistical significance. The purpose of a summary page is to give the viewer a quick sense of the relative performance of different providers. Since ranks and statistical significance can deliver contradictory measures, displaying both can defeat that purpose and result in confusion for the consumer.

- ***We recommend using only statistical significance.***
- ***We further recommend that the statistical significance be displayed with 1 – 3 stars for the quality metrics and 1 – 3 dollar signs for cost metrics where the symbols represent performance that is below average, not different from the average, and above average.***
    - For quality measures, the stars should be accompanied by the actual score which could be displayed as a bar on a bar chart.
    - For cost measures, the dollar signs should be accompanied by either the median cost or the 15thth to 85th percentile costs, with costs displayed as a bar graph that shows the 15th percentile cost on the left end of the bar and the 85th percentile cost on the right end of the bar.
- ***Finally, we recommend the QCC consider having the display show the best performers (above average for quality and below average for cost) at the top of the chart, followed by the average performers, with the lowest performers last.***
    - Within each category, providers should be listed in order of performance with the best at the top.
    - For example, all hospitals with above average scores on a quality indicator should be listed in rank order at the top of the chart, followed by the average hospitals in rank order and the below average hospitals in rank order (see examples on page 71).

Quality and Cost Council Analytic Consultant Report on Task 1: *Identification of Existing Quality and Cost Measures*

I. Overview of the Report

This report will review the work completed on the first task required under the Massachusetts Health Care Quality and Cost Council (the Council, QCC) contract with Massachusetts Health Quality Partners (MHQP) and its partner, the Milliman Corporation. The overall purpose of this work is to review the quality and cost measures included in the QCC's 2008 Reporting Plan and the presentation of the measures selected from that plan on the QCC's website, www.MyHealthCareOptions.org.

Specifically, the following analyses of cost and quality metrics were performed:

- Assessment of the utility of the measures selected for inclusion on the QCC website in December 2008 as well as those recommended by the Council's consultant but not included on the website
- Recommendations for updates to the calculation of the above measures from the sources used in the 2008 reporting plan or from alternative sources, where they better meet the measurement goals of the Council
- Determination of databases and tools that could be purchased to enhance the website and that will be assessed in terms of cost effectiveness after further discussion with the Council
- Determination of which measures may be related to ethnic and racial disparities and which of these, if any, include data that would allow one to identify these disparities
- Identification of gaps in measurement to be investigated for inclusion in future reporting plans

The following additional analyses were performed relative to the presentation of the measures on the current QCC website:

- Assessment of the websites' effectiveness based on established criteria for successful consumer websites
- Review of the measure definitions, scoring and aggregation methods, statistics, and benchmarks in terms of the goals and criteria

- Review of the various pages of the website and the display of results on the web in terms of the goals and criteria

- Recommend short and long term changes to the above if needed

Finally, we analyzed the methodological approaches to displaying quality and cost information on the website, and made recommendations for maintaining or changing these approaches.

In the following sections of the report we will focus on each of the areas above.

- Section II will review the quality measures and disparities issues
- Section III will assess the cost and utilizations measures
- Section IV will summarize gaps in terms of provider types and locations
- Section V will review the display of the current website
- Section VI will review methodological issues and recommendations for the website
- Section VII will provide conclusions and next steps

II. Quality Measures and Disparities

A. Scope of Review

The evaluation of quality measures for reporting on the Quality and Cost Council's website is discussed in three phases. First, the measures of hospital performance currently displayed on the Council's website are reviewed in terms of how well they address the goals of the Council and the Principles for selecting quality measures. Next, additional areas for measurement of hospital performance reviewed by the QCC Consultant are reviewed and suggestions for expansion of the measure set are drawn from both the Consultant's inventory and recent advances in measure development and reporting on hospital quality. Finally, measures of ambulatory care performance that meet the Council's principles are recommended. Measures for both hospital quality reporting and ambulatory quality reporting are recommended for either the 2009 Reporting Plan, 2010 Reporting Plan, or later.

In addition to evaluating existing measures and proposing new measures, each of the existing measures will be reviewed in terms of its implications for reducing racial and ethnic disparities in care. Both hospital and ambulatory care measures will be evaluated in terms of: (1) the evidence that disparities in care may exist for the condition or procedure represented in a recommended measure; and (2) the feasibility of achieving sufficient sample size for a given measure to be able to determine whether a disparity exists. In some cases, individual measures

may have to be bundled into composite or summary measures to achieve a sufficient sample, while others may need to be aggregated across individual hospitals that serve a defined geographical area or those that belong to a larger hospital system.

B. Hospital Care Quality Measures

The initial discussion focuses on hospital quality measures that were recommended for reporting and included in the 2008 Reporting Plan. These quality measures are currently displayed on the Council's website, MyHealthCareOptions. Currently reported quality measures are discussed in the same categories as presented on the website (see Table 1). Within each category the existing measures are first discussed in terms of their consistency with the QCC criteria for selecting quality measures and then in terms of scope and priority. Recommendations are offered as to whether existing measures should be retained, revised, or dropped. Recommendations for revising existing measures will apply only to measures that were created by the operations vendor and for which updated and revised technical specifications have been issued since the version used for currently reported measures. Measures produced by other organizations and licensed or downloaded in calculated form incorporate the most recent updates to their respective technical specifications.

Table 1: Measure Categories Currently Reported on MyHealthCareOptions

• Patient Safety	• Patient Experience

• Surgical Care	• Bone and Joint Care
	  ○ Back procedure
	  ○ Hip fracture
	  ○ Hip Replacement
	  ○ Knee Replacement

• Digestive System
  ○ Gall bladder surgery
  ○ Intestinal surgery
  ○ Weight-loss surgery
	• Heart Care
	  ○ Angioplasty
	  ○ Bypass Surgery
	  ○ Heart Attack
	  ○ Heart Failure
	  ○ Heart Valve Surgery
	  ○ Stroke

• Obstetrics
  ○ Cesarean Section
  ○ Normal Newborn
  ○ Vaginal Delivery
	• Respiratory Care
	  ○ Chronic Obstructive Pulmonary Disease (COPD)
	  ○ Pneumonia

• Outpatient Diagnostic Procedures	• Outpatient Radiation

Summary of current measure strengths:

Most of the quality measures displayed on MyHealthCareOptions reflect national consensus measures that have broad stakeholder support and meet the Quality and Cost Council's Principles for Selecting Quality Measures. Endorsement by the National Quality Forum is recognized as the highest level of national consensus on quality measures. However, without the adoption of NQF-endorsed measures by organizations such as CMS, the Hospital Quality Alliance, The Joint Commission, the AQA Alliance or the National Committee for Quality Assurance, many NQF-endorsed measures have never been collected or reported, and some have seen very limited use. Consumer-Purchaser Disclosure, a national alliance of large public and private health care purchasers and consumer groups has established guidelines for selecting quality measures for public reporting. These guidelines allow for the use of supplemental measures while establishing a hierarchy for the selection of national consensus measures. NQF Endorsement is the primary selection criterion. Then if there is no NQF endorsed measure in a key gap area, we look to measures adopted by a national accrediting organization or a broadly representative national stakeholder group like the Hospital Quality Alliance or AQA Alliance. These organizations can be distinguished from stakeholder organizations, like Leapfrog, which are not broadly representative of all stakeholders. Leapfrog only represents purchasers.

- Guideline I. NQF Measures Primary: NQF endorsed measures will be utilized where data for such measures are available and where there are clear and specific implementation rules that assure measures are consistently applied. Among NQF-endorsed measures, preference should be given to those measures adopted by the AQA, Hospital Quality Alliance, or other national quality alliances that engage in consensus measure selection.

- Guideline II. National Accreditor Measures Secondary: If the NQF has not endorsed a measure to represent an aspect of health care performance, measures endorsed by national accrediting organizations such as NCQA and JCAHO will be utilized to fill gaps. This Guideline will be reconsidered if significant changes occur in a national accreditor's governance and/or policies or if its measures are not regularly refreshed. CMS, AHRQ and national medical specialty societies shall be deemed "national accreditors" as long as they document a scientifically rigorous vetting process that assures considered input from all major stakeholders for measures that they endorse.

- Most of the surgical procedures are elective, giving consumers an opportunity to seek the type of information displayed on the website. Similarly, most of the medical conditions are chronic,

so that consumers can plan ahead by educating themselves about their condition and where the best care may be obtained.

- Several of the procedures are high risk procedures that may prompt more consumers to shop around for the best care available.

- Many of the quality measures are outcome measures, which are preferred by consumers and easier for them to understand. All outcome measures have been risk-adjusted to account for differences in the patient populations treated in different hospitals.

Areas for Improvement:

- The current measure set includes some quality measures that have not received national endorsement by the National Quality Forum or been adopted by nationally recognized, broadly representative, stakeholder groups or national accrediting bodies, such as the Hospital Quality Alliance or The Joint Commission, respectively. Examples include:

    - All composite measures developed by The Leapfrog Group (e.g. heart valve surgery composite, weight-loss surgery composite)

    - AHRQ Quality Indicators that were not endorsed by the National Quality Forum (e.g. hip fracture mortality, heart attack mortality)

- Some of the current quality measures do not reflect the highest priority medical conditions or procedures in terms of consumer interest, disease burden, integration of quality and cost information to promote quality improvement and cost containment, or reduction of racial/ethnic disparities. The inclusion of these measures may reflect an opportunistic rather than a strategic approach to measure selection. Given limited resources for the creation, license, or purchasing of additional quality measures this approach may not be the best use of the Council's resources going forward. Examples of lower priority procedures and conditions include:

    - Gall bladder surgery

      There are no quality measures available for gall bladder surgery. With regard to cost data, only inpatient cost data are displayed. The majority of inpatient cholecystectomies were performed laparoscopically. However, half or more of laparoscopic cholecystectomies are performed as ambulatory surgery procedures making the reporting of inpatient costs for gall bladder surgery (without comparative outpatient surgery costs) less meaningful than for procedures that are performed primarily on inpatients.

- Heart valve procedures

  Cardiac valve procedures did not rank among the top 50 DRGS by discharge volume, total cost or total acute inpatient days in 2006. While the surgical infection prevention measures for "Other Cardiac Surgery" could potentially be reported for heart valve procedures, the Leapfrog composite measure is not endorsed by the NQF or any other broad stakeholder group.

- Hip fracture

  Hip fracture surgery was not ranked among the top 100 DRGs by discharge volume, total cost or total acute inpatient days in 2006.

- Alternative sources exist for some measures that are more comprehensive, more timely, or less costly than some of those currently used. Examples include:

  - The Joint Commission's Quality Check downloads are free, more timely and contain data for more quality measures than Hospital Compare. Quality Check is generally updated at least two months before Hospital Compare, meaning that measures for the full preceding calendar year would be available by mid-June of the Reporting Year, enabling a fall update of the QCC website. Hospital Compare measures for the same calendar year would not be available until mid-September. Quality Check contains all of the Hospital Compare measures plus more comprehensive data on the surgical infection prevention measures. These measures are available by procedure category in Quality Check, whereas Hospital Compare includes only the summary measures across selected surgical procedures. It also includes a few additional measures not currently reported by CMS. However, Quality Check does not include data on the HCAHPS survey results.

  - HCAHPS obtained from CMS cannot be tested for statistically significant differences due to limitations in the available data. While the HCAHPS measures should continue to be accessed through Hospital Compare for Reporting Year 2009, the QCC should consider mandating that MA hospitals submit their HCAHPS results to the National CAHPS Benchmarking Database (NCBD) maintained by the Agency for Healthcare Research and Quality. Either the QCC or the DHCFP could serve as the NCBD Sponsor for a MA HCAHPS reporting initiative. Health plans in MA are currently mandated to report their CAHPS results to the NCBD. There is no cost for submitting data to the NCBD. The DHCFP is the NCBD Sponsor for the health plan CAHPS reporting. Sponsors are entitled to receive comparative performance reports with statistical significance analyses of the results at no cost. Customized NCBD reports can be obtained on a cost basis.

- The Leapfrog Group collects data from MA hospitals and licenses these data back to the QCC. The Council has the authority to ask MA hospitals to report many of the same measures directly to the Council. Several of their measures can be calculated from hospital discharge data using programs supplied by the Agency for Healthcare Research and Quality (AHRQ). Specifically, volume measures, NICU measures, the pressure sore measure and some mortality measures could be produced by the Operations Vendor. While most of the process-of-care measures used by Leapfrog have been nationally endorsed, their methodology for creating quality composite measures has not been validated and is unlike those used by CMS, The Joint Commission or NCQA. None of the Leapfrog composite measures has received NQF endorsement at this time.

- Several of the surgical procedures displayed on the QCC website have no quality measures, while unlike medical conditions, process of care measures are lacking for all of the specific surgical procedures.

    - Outcome measures may represent the "gold standard" for quality assessment, but process measures are important for understanding how to improve care. Both providers and consumers have a role in quality improvement. When appropriate coaching/educational content is provided on the website, process measures can enable consumers to understand which aspects of their care are important to achieving a good clinical outcome, thus motivating them to advocate for their own care and adhere to medical advice.

    - Surgical infection prevention is an important area in that it addresses consumer concerns about patient safety, represents an opportunity to prevent costly infections and contain costs, and provides the ability to present quality and cost information for selected surgical procedures in an integrated display. Specifically, the Quality Check database referenced above includes surgical infection prevention performance data for coronary bypass surgery, other cardiac surgery (e.g., PCI, heart valve replacement), knee replacement surgery, hip replacement surgery and intestinal surgery (specifically, colon surgery). Cost data for each of these types of procedures is included on the Council's website. The QCC website currently provides no quality data for knee replacement surgery or intestinal surgery. For coronary bypass surgery, heart valve replacement surgery, and hip replacement surgery the mortality rate is the principal or only quality indicator. The mortality rate measures displayed for heart valve surgery and hip replacement surgery do not have national endorsement. Adding the surgical infection prevention measures for the above-mentioned procedure categories would enhance the data currently displayed on the QCC website for the related surgical procedures.

- There are some obvious gaps in the conditions and procedures for which performance data are displayed on the website.
    - Most notably, there are no quality measures of pediatric or maternity care. While pediatric hospitalizations are not a high volume or high cost area relative to some of those displayed, research on users of consumer websites with comparative quality information shows that they are often women of child-bearing age and that these women are often looking for information about obstetrical care or about care for their children. Adding measures in these areas should help to draw more consumers to the website.
    - QCC should explore a data-sharing arrangement with MassHealth which is collecting all-payer quality measures for newborn care, pediatric asthma care and maternity care from MA hospitals. These measures are also being reported by race and ethnicity and may be useful for evaluating disparities in care.

An inventory of hospital quality measures that are currently publicly reported (including those on the QCC website) is provided in Appendix A. Measures that are publicly reported for MA providers are displayed first, followed by those that are not publicly reported but could be created from data sets available to the QCC using available technical specifications. Within these two groupings, measures are organized into the service categories shown in Table 1, with additional categories added to cover the range of available measures. Measures currently displayed on the QCC website have a value of "2" in the column labeled "QCC Flag" and the QCC website URL is displayed under the column heading "Reported Where". Measures that are not endorsed by the National Quality Forum are highlighted in yellow, while those receiving only time-limited NQF endorsement are highlighted in green. A recommendation is made regarding each of the measures currently reported on the QCC website, as well as those that could be added with marginal effort or expense. That recommendation appears in the last column under the heading "MHQP Recommendation".

C. Disparities in Hospital Quality of Care

There is an abundance of evidence that racial and ethnic disparities in care delivery exist across a wide range of care settings, conditions, and procedures. Almost every condition or procedure currently displayed on the QCC website has some evidence of a disparity at the national level or in the literature. Evidence at the state level has also been reported in the published literature and in a Massachusetts Department of Public Health Report on disparities in care by region of the state. A brief analysis of both the "opportunities" to reduce disparities that are likely to exist in hospital settings across Massachusetts may be found in Appendix B. For each opportunity, an estimate of the level at which data on either the measures or the delivery system would need to be aggregated is presented. For example:

- A bundled measure of surgical infection prevention may permit analysis of potential disparities at the hospital level, while
- An individual measure of care for heart attacks would need to be aggregated to the community or regional level.

Once priorities have been established for expanding the existing set of hospital quality measures, similar analyses will be performed on new measures proposed for display on the QCC website.

D. Ambulatory Care Quality Measures

Currently, there are no quality measures for outpatient care. The "fit" between the high volume outpatient procedures for which cost information is displayed and those for which related quality measures are available is poor. Recommendations for enhancing the outpatient care measures of quality available on the website encompass both recommendations for expanding the cost measures currently displayed and adding additional ambulatory care quality measures. An inventory of ambulatory quality measures that are either (1) publicly reported, (2) could be produced using the QCC dataset and available specifications, or (3) could be licensed for display on the QCC website, is presented in Appendix C.

- There are two obvious sources of quality information on ambulatory care:
    - HEDIS clinical effectiveness measures, that are widely reported to the physician community and that can generally be attributed to one or more physicians for analysis at the individual, practice, or network level; and
    - Patient experience measures that are currently collected and reported by MHQP.

- Pairing quality and cost information for the same conditions presents a challenge, but there are some opportunities that can provide a good starting point. Examples include:
    - Other than mammograms, none of the outpatient procedures associated with available quality measures (e.g. colonoscopy, spirometry, spine x-rays or MRIs specifically of the spine, or dilated retinal exams) is currently available. The QCC should evaluate the adequacy of the health plan claims data for reporting on the cost of these additional outpatient procedures. There is no information about prescription drug prices or generic alternatives. Several quality measures involve prescription medication use rates, and medication costs are a concern for most consumers. Generic prescribing rates may be a measure worth pursuing and could be paired with these quality measures in addition to cost information. The QCC should begin testing logic now to develop measures of generic prescribing rates and drug costs for 2010 or 2011.

E. Disparities in Ambulatory Quality of Care

While hospitals in Massachusetts have been collecting self-reported data on patients' race and ethnicity for over two years, health plans have only begun to do so. As a result, the QCC database from which ambulatory care quality measures may be derived does not currently contain these data. It is likely that it will take years before health plans can provide race and ethnicity data for a sufficient proportion of their members to support stratification of measures like HEDIS by race/ethnicity. The Brookings Institution has worked with the Race/Ethnicity Expert Panel appointed by the QCC to evaluate options for the collection of race and ethnicity data by health plans. The Expert Panel will make recommendations to the QCC not only on how health plans should collect self-reported race/ethnicity data, but also on how those data might be supplemented with geo-coding and surname analysis tools to support population-based analyses of health care disparities. Based on the assumption that self reported data will need to be supplemented for a number of years before a critical mass of data are available to support disparities measurement, recommendations for the types of quality measures where disparities have been identified and the levels of aggregation that are likely to be necessary to measure disparities in the ambulatory setting are presented in Appendix D.

As an example, measures of disparities in care for ischemic heart disease are likely to be feasible only at the community or regional level, while measures of preventive screening rates may be feasible at the practice or group level. These estimates assume that a combination of self-reported and geo/surname-coded race/ethnicity data will be available for approximately 95 percent of the health plan population currently reported. If data for self-insured members were to be added to the health plan submissions, and data for Medicare and Medicaid

beneficiaries could be obtained by the QCC, the numbers would increase substantially, making analysis of disparities at the practice or group level possible for several more quality measures.

III. Analysis of Cost and Utilization Measures

A. Issues with Provider and Payer Cost Data

Healthcare cost and utilization data are often viewed as more difficult to interpret and assess when compared to data from other types of transactions involving goods or services. One overriding influence is that three major parties are involved in a healthcare service transaction: the service provider, the service payer and the service recipient or consumer. This is unlike transactions for many other products and services in which only two parties may be involved: the provider and the payer who is also the consumer.

The frequent lack of clarity around definitions of service payment and service units can confuse consumers looking for a simple display of hospital pricing on a website. To aid in understanding the variability of approaches used for displaying healthcare cost and pricing information, we have summarized some of the key payment and utilization issues and the reporting incentives for the different parties involved in a healthcare transaction.

1. Provider Perspective

Some healthcare databases, most notably the federal Medicare Cost Reports for hospitals, focus on healthcare service provider costs. In many ways, the structure of healthcare service costs parallels those in other industries, essentially the cost of time and materials plus administrative overheads.

The allocation of these costs to specific services, especially for institutional providers, and then the reporting of those costs, is more problematic. Reasons for this include:

- *Regulatory requirements can distort cost accounting procedures.*
  This problem has historical roots in Medicare, which at one time reimbursed hospitals based on an accounting of costs according to specified reporting requirements. This approach gave some hospitals incentives to report cost data to maximize reimbursement. Medicare continues to collect this cost information, although the

Medicare payment system has changed to set fees based on the Diagnosis Related Group (DRG) to which a hospital assigns a patient.

- *Cost allocations for services are made more complicated as a result of missions and mandates in addition to patient care that can contribute to costs and revenues for a service.*
  Certain service costs may be funded in part by research grants and charitable contributions, among other sources. These contributions can lower the reported costs for providing services. On the other hand, provider overheads may incorporate costs for non-compensated care such as charity care or patient non-payment of bills, which can inflate the reported costs of providing services.

- *Payers may establish pricing structures that do not directly reflect a hospital's costs for providing a specific service.*
  For example, a hospital may receive payments based on its charges, the number of days of an inpatient stay, diagnostic grouping for the patient's condition, and so on. Further, the government sets rather than negotiates prices, which may not directly relate to actual costs for a specific service. Therefore, hospitals can be more concerned about whether aggregate revenues cover aggregate costs rather than the costs of a specific service, and this can influence their approach to cost accounting.

- *Reported charges and service prices built from those charges may serve as a starting point in negotiations with some payers.*
  A discount on billed charges is a common provider reimbursement method. As a result, some providers may have an incentive to maximize certain reported costs to establish a better negotiation position.

- *Providers that specialize in certain services, for example certain types of high risk neurosurgery may have an advantage in negotiating prices with payers for those services.*
  Provider reimbursement negotiation is affected by supply and demand. Therefore, prices for which the hospital has an advantage in its negotiations may be relatively higher in relation to costs, when compared to services available from multiple sources. For example, basic diagnostic screenings may be a commodity offered by many providers in a service region, offering little leverage for negotiating a favorable payment level. Alternatively, highly specialized services may be offered by only one or two providers in an area; a situation that may give those providers significant negotiating

power for those services. Providers may have an incentive to identify costs associated with either the specialized service or the commodity in a manner that can assist in price negotiations.

Analyses based on reported provider costs or charges can lack reliability since incentives are limited for accurate reporting and providers may evaluate their costs or determine charges through a variety of methods. Nonetheless, this information tends to be more widely available when compared to actual negotiated prices, and therefore has become the basis of information found on many consumer websites.

2. Payer Perspective

Healthcare costs to payers represent the specific amount paid for a service. To determine the payment amount, payers follow a process with the following elements:

- *Receipt of a charged amount from a service provider with a description of the service.* The provider almost invariably submits this "invoice" for services rendered to the payer. The healthcare industry has established standardized formats for these invoices, which can be submitted using a variety of mechanisms (i.e. paper forms, electronic data interchange transactions, direct data entry via the Internet, etc.).

- *Potential recoding or bundling of the charge to reflect a payer's service coding rules.* Rules on how a service is either bundled with other services or unbundled from a service can impact counts of service utilization. For example, separating or combining a laboratory diagnostic procedure performed in a physician's office and a physician's diagnostic evaluation, can mean either one or two services have been provided from the payer's perspective.

- *Adjustment of the charges to a rate that reflects any negotiations of rates between the payer and provider.*
  Typically, payers negotiate fee schedules with providers that detail the fees that will be paid for services rendered. There are dozens of reimbursement methodologies ranging from simple "percent-off" discounts based on billed charges to complex resource-based schemes that pay per-unit amounts based on the number of units required to provide the services. When considered within the total volume of reimbursed services, reimbursement at 100% of billed charges is rare (but does occur in certain circumstances).

- *Adjustment of the negotiated rate to be paid to reflect any limitations on a covered individual's benefits.*
  For example, certain procedures may not be included under covered benefits. Excluded services may be the result of plan exclusions (i.e. cosmetic surgery), failure to follow administrative requirements (i.e. service was not pre-authorized), or a lack of medical necessity (typically determined by the payer using third-party medical necessity criteria).

- *Establishing a "payable" amount that the payer will pay given the plan benefit design.*
  The final determination of the amount that the insurer will pay depends on the insured individual's benefit plan design. Payers apply a variety of plan-specific adjustments such as copayments, coinsurance, deductibles, and unit limitations, accumulators, and maximum benefit provisions prior to arriving at the reimbursement amount.

The QCC website reports paid amounts that include both the payer's amount paid and the insured's amount paid in identifying the price for a procedure. This combination of amounts paid is often referred to as the "allowed" amount. Some of the limitations of this approach include:

- The payment amounts are dependent on contracts negotiated between the payer and the provider. Different payers can have vastly different negotiated rates with the same provider; and one provider can have vastly different negotiated rates with different payers.

- Payer negotiated prices can represent groupings of services, such as DRGs, episode payments, or inpatient days. Different payers may use different grouping methods, or pay based on charges, and even payers with the same grouping method may have significant differences in how a group is defined. For example, payers can vary in payment rules for high cost cases that may provide an exception to the normal grouping rules. Therefore it is often difficult to provide apples-to-apples price comparisons.

- Counts of service units can vary depending on a provider's grouping or service bundling rules. For example, some payers may consider post-operative visits as part of the related surgical procedure, while others may record these visits as separate services.

- Payer grouping methods, in general, shift significant cost risk to the provider with actual costs for a service potentially varying widely. The provider that accepted the grouped

payment is expecting that high and low cost cases will balance out so that the payments in total will cover service costs. A payer using a payment method more closely representative of charges is likely to experience much wider variations in prices.

- Negotiated prices can vary significantly by payer depending on volume of referrals and exclusivity of using a provider. Thus, one provider used with some exclusivity by a payer and therefore accounting for a significant volume of business may indicate relatively low average prices. When any other payer uses this provider, however, pricing may be much higher.

3. Consumer Perspective

Given provider issues in clearly establishing costs, a relatively complicated payer process for establishing paid amounts, and wide variations in payment systems, a consumer may reasonably be confused as to how to evaluate the potential costs for a specific procedure. To further complicate matters, provider costs for a given procedure can vary based on a number of unique characteristics of the patient and the circumstances that required the intervention. For example a heart by-pass operation on an individual with other related medical problems may require more resources than the same operation on an otherwise healthy individual.

As a result, unlike the case for most consumer goods, consumers need to be prepared for an especially wide range of potential variations from an average price. Moreover, consumers choosing to have some control over prices need to be prepared to work with providers to understand the specific issues and needs that may shape the costs for the care that they require.

The QCC website data show major variations in hospital costs for a given procedure that do not appear to be explained by either the level of complications for the procedure or variations in the quality of care. Although interpretations of the reasons for these differences may vary, they provide consumers a point of reference for improving the cost-effectiveness of choices among providers while still assuring a standard for quality. The remaining sections of this document will review options available to QCC for improving the information available to consumers via its website for making effective decisions in selecting among provider options.

B. Consumer Website Comparisons

This section compares the cost information displayed on the MyHealthcareOptions website to other websites with provider healthcare cost information that also target consumer users. The section will consider the following:

- Cost Measures Categorization and Searching
- Cost Data Sources
- Methodology Reporting
- Display of Benchmarks
- Use of Databases
- Use of Data Analysis Tools

1. Overview

With the exception of the MyHealthcareOptions and the PricePoint websites, described below, there is limited cost information available on public websites to support simple consumer price comparisons among hospitals. The Wisconsin Hospital Association launched the first PricePoint site in February 2005 and currently 13 state hospital associations offer PricePoint consumer websites for comparisons of hospital costs. Each PricePoint site allows users to search by location and procedure within a state for cost comparisons among hospitals within their state. Hospital associations in the following states sponsor PricePoint websites:

- Wisconsin
- Oklahoma
- Utah
- Oregon
- Nevada
- Iowa
- New Mexico
- Nebraska
- Rhode Island
- Montana
- Virginia
- New Hampshire
- Texas

The PricePoint sites present relatively easy-to-use tools for searching and displaying comparative costs for hospital inpatient and outpatient services in a targeted geographic area. PricePoint sites, however, use billed charge data from healthcare claims to develop cost estimates in contrast to the actual amount paid to hospitals for care by insurers on behalf of

the insured (i.e. “paid claims”) used for hospital price comparisons on the MyHealthcareOptions site.

2. Cost and Utilization Measure Categories

Cost categories are groupings for organizing health service treatment information for payment or analysis. At the most basic level these groupings can be descriptions of hospital charges (that is, the dollar amount that a hospital bills for a patient’s care before any adjustments as a result of payer negotiations or payer bill repricing) or physician billings by procedure (typically Common Procedural Terminology (CPT) classifications developed by the American Medical Association). Patient diagnoses are another common grouping method, especially for hospital care. The International Statistical Classification of Diseases (ICD) categories, maintained by the World Health Organization, is a common basis for the Diagnostic Related Group (DRG) methodology that Medicare uses for hospital payment categories. The QCC website service categories for providing consumers with cost and quality information also incorporate DRGs. Table 1, below, provides a summary of cost categorization and drill-down capabilities for each of the websites reviewed.

Cost Data Categorization and Drill-Down Capabilities – Table 1

Website	Description	Basic Categories Reported	Category Drill Down Capabilities	Data Source
Massachusetts Healthcare Quality and Cost Council MyHealthcareOptions	Healthcare cost and quality reporting site targeted to consumers receiving care at Massachusetts hospitals.	Bone and Joint Care, Digestive System, Heart Care, Obstetrics, Respiratory, Outpatient Diagnostic Procedures, and Outpatient Radiation	The website allows the user to drill down to more specific procedures within each of the basic categories.	Paid Claims*
PricePoint Sites (Oklahoma, Wisconsin, Utah, Oregon, Nevada, Iowa, New Mexico, Nebraska, Rhode Island, Montana, Virginia, New Hampshire, and Texas)	Collection of sites providing cost and utilization data for each of the participating states. Started in Wisconsin.	Alcohol and Drug Abuse, Bones, Joints, Muscles, Childbirth and Newborns, Heart/Cardiovascular, Psychiatric, Rehabilitation, Stomach/Digestive, and 10 most common types of hospitalizations	There are two search level capabilities within the PricePoint state sites. ▪ Non-healthcare professionals can search using a Basic Query within the basic categories listed. These categories allow further drill down to more specific DRG based procedure groupings. ▪ Users more familiar with coding can conduct an Advance Comprehensive Query allowing a search by Major Diagnostic Categories (MDCs) and then drill down to Diagnosis Related Groups (DRGs).	Billed Claim Charges
New Hampshire Health Cost *(Separate site in addition to PricePoint site)*	Site with healthcare cost information to assist patients with insurance from New Hampshire carriers	Preventative Health, Emergency Visits, Radiology, Surgical Procedures, and Maternity	After entering insurance information, users can start by picking a basic category (described in column on left) and then drill down further to procedure categories.	Paid Claims

Website	Description	Basic Categories Reported	Category Drill Down Capabilities	Data Source
Rhode Island Dept. of Health Performance Measurement and Reporting *(Separate site in addition to PricePoint site)*	Quarterly Hospital financial and utilization reports in Microsoft Excel and Adobe Acrobat form.	Total Hospital per-capita cost reported for all states on a state by state basis.	This data is not readily searchable. It is presented in Adobe Acrobat and Microsoft Excel format and must be downloaded and examined. It does not address specific procedures or procedure costs.	Not Stated on Site
Pennsylvania Healthcare Cost Containment Council (PHC4)	Quarterly Pennsylvania hospital financial reports.	Net Income, Net Revenue, and Total Margin	This data is not readily searchable. It is presented in Adobe Acrobat format and must be downloaded and examined. It does not address specific procedures or procedure costs.	Billed Claim Charges

* Paid claims here and in all references hereafter, refers to the actual amount paid to providers for care by insurers on behalf of the insured. Paid amounts usually vary significantly from billed amounts due to application of benefit plan rules, negotiated discounts, patient responsibility amounts, and other pricing adjustments.

Appendix F provides more detail on cost website categories.

3. Carol.com

In addition to the public-sector web sites listed in the chart above, Milliman also reviewed a commercial site: Carol.com. This website offers data on services in two regions: Seattle, Washington and Minneapolis, Minnesota. The website uses billed hospital claim charges and has agreements with area insurers that permit consumers to input their benefit information and receive more accurate cost estimates. The cost estimates provided are for Carol.com care service packages that represent a bundle of services involved with a specified procedure. For example, consumers can choose a diabetes package which includes a physician visit and a class to help teach the consumer how to manage their diabetes more effectively. The details of the package are described, priced, and reviewed and rated by others who have bought the package.

4. Cost Analysis Methods

Unlike other consumer-focused websites with statewide provider information, the QCC website provides details on its cost methodology compared to other consumer websites. The methodology addresses both the approach to calculating measures and how claims were selected for inclusion. The QCC website discusses the following topics relating to methodology:

- Statistical significance testing to determine the probability that the differences with other providers would occur by chance.
- Risk adjustment for patient severity of illness on a scale of 1 to 4.
- Minimum sample size requirements that the hospital have at least 30 inpatient discharges or 30 outpatient visits for a given condition so as to ensure statistically valid data samples.

No other site reviewed provided the equivalent level of details on the methodology for cost calculations comparisons.

5. Methodology for Average Cost Calculations

One important issue affecting cost calculation is the use of mean or median for measurement and display. There are advantages and disadvantages to both methods. Using a "mean" would appear to have the greatest application in public policy and research analyses, although not necessarily a consumer website, since the mean times the number of cases represents the total amount of dollars in a category.

Claim data do not typically follow a normal distribution, however, but rather are likely to be “skewed” with long tails of large claim amounts. Therefore, it is reasonable to expect that the mean claim payment in a category is higher than what most patients paid for a procedure. It would require detailed analysis to determine how much higher and this result may vary by treatment category.

Of the sites examined for this report we found medians were most commonly reported, although the PricePoint sites provide both means and medians. The results of our research are shown in Table 2 below.

Mean vs. Median – Table 2

Cost Website	Method
Massachusetts Healthcare Quality and Cost Council MyHealthcareOptions	Median Paid Claims
PricePoint Websites	Mean Charge Mean Charge per Day Median Charge
New Hampshire Health Cost (Separate site in addition to PricePoint site)	Median Paid Claims
Rhode Island Dept. of Health Performance Measurement and Reporting (Separate site in addition to PricePoint site)	Mean (Total Cost* divided by Total Population by state)
Pennsylvania Healthcare Cost Containment Council	Neither (Dollars per Provider)

* Total Cost refers to the total out-of pocket cost to the consumer receiving care (inclusive of copayment, coinsurance, and deductible amounts, plus any amount above the plan's maximum benefit).

Appendix F provides more detail on cost website methodologies.

C. Benchmarks

Benchmarks provide a standard for judging performance. Cost and utilization benchmarks often focus on performance compared to average or better performance of peer providers. This contrasts with quality of care standards, which are more likely to consider "ideal" or preferred practices.

The QCC website "benchmarks" hospitals by comparing their expected procedure costs against the expected costs found among other Massachusetts hospitals. QCC determines these benchmarks using a database of Massachusetts commercial insurer claims. QCC's practices compare favorably to other state websites that provide comparison reports of procedure charges at one or more hospitals but do not provide a benchmark average or expected costs for the state or region.

Commercially available products, such as the data analysis tools described in Section E below, commonly permit users to benchmark performance of providers or benefit plan designs. They

can also risk adjust results to account for varying levels of severity in the condition being treated.

These products rely on nationwide databases consisting of millions of claims and incorporate statistical algorithms that support development of benchmarks for specific providers, plan designs or benefit packages, or geographic regions, such as Massachusetts and its adjoining states. Unlike many public websites that display hospital comparison information based on billed charges, commercial benchmark databases are almost always based on paid claims.

Benchmarks could help consumers better assess the significance of cost differences among local hospitals. For example, benchmarks could help consumers decide the low cost of care in a local hospital is well within norms of a region and not a reflection of poorer quality.

A comparison of the QCC website's benchmark capabilities with that of other websites is shown in Table 3 below.

Cost Website Benchmarking Capabilities – Table 3

Website	External (Third Party) Benchmarks	Internal Comparisons	Information Source
Massachusetts (MyHealthcareOptions)	No	Yes	Paid Claims
PricePoint Sites (OK, WI, UT, OR, NH, VI, NV, IA, NM, RI, MT, TX)	No	Yes	Billed Claim Charges
New Hampshire Health Cost	No	Yes	Paid Claims
Rhode Island Dept. of Health Performance Measurement and Reporting	Yes	No	Not Stated on Site
Pennsylvania Healthcare Cost Containment Council	Yes	No	Billed Claim Charges
Carol.com	No	Yes	Not Stated on Site

Appendix F provides more detail on cost website benchmarking capabilities.

D. Databases

The QCC website uses a statewide healthcare claim database collected from commercial health insurers. As a result of using this data source, QCC appears to have available a greater level of procedural level detail than found on other state consumer websites, which most frequently appear to rely on information typically found in the Medicare Cost Reports that hospitals submit to the federal government annually.

Both public and commercial organizations maintain claim databases that are national in scope. QCC has the option of obtaining or licensing these databases which have the potential for improving the QCC website's benchmarking capabilities.

Table 4, below, identifies other third-party standalone databases that QCC may want to consider.

Cost Databases – Table 4

Database	Sponsor	Data Source
Ingenix* *Commercial*	Thomson Healthcare a subsidiary of Ingenix, a UnitedHealthcare company	• Claim Charges Data
MarketScan *Commercial*	Thomson Healthcare a subsidiary of Ingenix, a UnitedHealthcare company	• Commercial, Medicare Supplemental, Medicaid and Claim Charges Data
MedPar *Public*	Centers for Medicare and Medicaid Service (CMS)	• Medicare Claim Charges Data
Healthcare Cost and Utilization Project (HCUP) Databases *Public*	Agency for Healthcare Research and Quality	• Survey of Hospital Inpatient Discharges • Surveyed Claim Charges Data • Survey of Hospital Ambulatory Care Discharges
Consumer Assessment of Healthcare Providers and Systems (CAHPS) Database *Public*	Agency for Healthcare Research and Quality	• Hospital Inpatient Discharges • Surveyed Claim Charges Data • CAHPS Hospital Survey

The Ingenix database, used by many insurers for calculation of "usual and customary" charges, was recently the subject of a legal settlement between the State of New York and Ingenix. That settlement is expected to result in the creation of an equivalent database managed by new independent third party, such as a university. Ingenix continues to manage this database awaiting determination of the third party.

Appendix G provides more details on cost databases.

In addition, commercial data analytics vendors may offer claim databases along with their data analysis toolsets. For example, Milliman's MedInsight product incorporates MarketScan data along with its own proprietary claims data.

E. Data Analysis Tools

QCC provides consumers website tools for identifying hospitals and for selecting procedures for comparative analysis. Consumers can search for measures by hospital name or geographic area based on zip codes. The majority of websites we reviewed that offer hospital specific data, used similar methods for identifying hospitals. It was less common, however, to be able to search for data on procedure groupings. One feature that we found on some websites, but is not available on the QCC website, is a capability for the user to incorporate benefit information in cost comparisons.

Table 5 compares the QCC website cost measure search tools to those of other consumer websites.

Cost Website Search Abilities – Table 5

Cost Websites	Inpatient/ Outpatient Search Options	Location Search (City, County, Zip)	Location Search with radius	Procedure Search	Provider Search	Insured/ Uninsured	Not Searchable
QCC Website	No	Yes	Yes	Yes	Yes	No	N/A
PricePoint Websites	Yes	Yes	No	Yes	Yes	No	N/A
New Hampshire Health Cost	No	Yes	Yes	Yes	Yes	Yes	N/A
Rhode Island Dept. of Health	No	No	No	No	No	No	Yes
Pennsylvania Health Cost Containment Council	No	No	No	No	No	No	Yes
Carol.com	No	Yes	Yes	Yes	Yes	Yes	N/A

Appendix F provides more details on cost website search capabilities.

Commercial data analysis products provide a wide range of tools that exceed the current search functions on the QCC website. These commercial database analysis tools are commonly integrated into commercial data warehouse products although they could also be developed or purchased separately. While these tools are very robust, QCC may consider just implementing

a portion of these capabilities. For example, QCC's website could incorporate drill down capabilities, quick comparisons to benchmarks, or graphical depictions of data as an aid to consumers using its website.

Although there are numerous commercial tools available, the ones associated with commercial data warehouse products are similar in their capabilities. Note that the tools commonly permit risk adjustment of findings to consider medical condition severity for more meaningful comparisons.

The table below summarizes characteristics of typical commercial data analysis tools.

Common Capabilities of Reviewed Data Analysis Tools – Table 6

Characteristic	Description
Tool Capabilities	• Data Warehouse Support • Treatment and Cost Grouping • Reporting Tools and Interfaces • Evidence Based Measures (EBMs) • Data Management • Decision Support • Process Automation • Trend Monitoring • Graphic Presentation • Risk Adjustment
Searchable Categories	• By Provider • By Services • By Conditions • Employer Plans • Evidence Based Measures • Episode Treatment Groups
Types of Data	• Costs • Clinical • Operational • Utilization
Benchmarking Capabilities	• Cost • Quality • Utilization • Diagnosis Related Groups • Pharmacy • Medicaid • Medicare

Appendix H provides more details on data analysis tools.

F. Grouping Methods

QCC's website groups cost data using 3M APR DRGs. 3M APR DRGs are an extension of the basic DRG structure, which includes four severity-of-illness levels and four risk of mortality levels within each DRG. The 3M APR DRG severity and mortality subclasses are assigned according to a clinical logic that simultaneously evaluates the interactions of multiple co-morbidities, age, procedures, and principal diagnosis. The use of DRG-based grouping methods is common among many sites and within commercial products. DRGs are readily available and widely understood as an established method of grouping.

Other claim grouping methods are available and in wide use. Grouping methods may incorporate paid or billed prescription drug, outpatient, diagnostic and hospital claim data and therefore provide a more meaningful way to display treatment costs than a website display that shows only hospital facility costs. For example, Ambulatory Payment Groups cluster different ambulatory procedures related to a care episode, such as diagnostic radiology and the initial and follow-up visits associated with an outpatient surgical procedure.

The chart below describes widely used claim grouping alternatives:

Cost Data Groupers – Table 7

Grouper	Grouped by	Source
Diagnosis Related Groups *Public*	Diagnosis	Hospital Discharge Data
Episode Treatment Groups (ETG) *Commercial*	Episodes of Treatment	Inpatient Claims Outpatient Claims Ancillary Claims Physician Claims Pharmacy Claims
Medical Episode Group (MEG) *Commercial*	Severity of an Episode	Inpatient Claims Outpatient Claims Ancillary Claims Physician Claims Pharmacy Claims
Ambulatory Payment Groups (APG) *Commercial*	Ambulatory Episodes	Hospital Outpatient Claims
Ambulatory Payment Classifications (APC) *Public*	Ambulatory Episodes by Cost	Hospital Outpatient Claims Costs

Appendix I provides more detail on the grouper options.

G. Recommendations

We found many aspects of the MyHealthcareOptions website to as a good or better than the practices of other sites, although there are some opportunities for improvement.

1. Current Positive Features

The MyHealthcareOptions website exhibits several important strengths in its display of cost information:

- Use of paid claim data (including the patient's copayment amount) rather than billed charge data provides a more meaningful basis for hospital comparisons. Hospital practices for setting charges can vary significantly between hospitals and may bear only limited relationship to prices that hospitals negotiate with insurers, which are often significantly less.

- Explanation of statistical methods for calculations. While many consumers may not have great interest in statistical methods, their publication on the website improves the transparency of the data presented. There is some potential for further improvements in the wording to make the explanations more easily understood by those users interested in this level of detail.

- Risk adjusted hospital comparisons that consider differences in the severity of the medical conditions treated permit more meaningful comparisons between hospitals.

- Side-by-side comparison of data from selected hospitals aids in analyzing differences among healthcare options.

- Specification of a minimum sample size of 30 cases before display of findings supports more appropriate, statistically-significant comparisons.

2. Short Term Improvements

Based on our assessment, we recommend one improvement for QCC's attention in the short-term:

- In addition to the median price currently provided for comparison purposes, adding cost ranges, such as at the 15^{th} and 85^{th} percentile costs. In some cases, procedure costs will vary considerably and this would help give the consumer greater insight on potential costs.

3. Longer Term Improvements

These areas will be addressed in more detail in future reports. Based on this initial review, however, areas worth further consideration include:

- The addition of a capability for users to enter insurance information and receive an estimate of their own expected costs. For example, at the State of New Hampshire consumer site, after selecting a procedure, visitors are directed to a webpage in which they enter demographic information, the name of their insurance carrier, coverage type (HMO, PPO, etc.), deductable and copayment requirements. The website then provides an estimate of likely out-of-pocket costs.

- Exploration of the legal and regulatory issues relative to the addition of self-insured employer and multi-employer claims to the database. Adding these populations should significantly increase the robustness of the data which now only includes commercial fully-insured paid claims.

- Comparison of the Massachusetts hospital paid claim levels to benchmarks based on national data and also, possibly, to Medicare rates. This would allow consumers to better understand the significance of high or low costs of Massachusetts hospitals within a broader context. For example, a consumer may find it valuable to know that a local hospital is well within expected cost ranges given costs for hospital care nationally even if its costs might appear significantly different than other local hospitals.

- The addition of average length of stay information to permit consumers to better assess differences among provider alternatives.

- More sophisticated analytical tools to enable consumers, providers, employers or other stakeholders to "drill down" further into the components of expected costs and comparisons among alternative providers. In addition, such tools could permit users to switch views of findings between table and graphical displays depending on how they are best able to assess alternatives.

- The inclusion of cost information for treatment modalities other than hospital care such as physician services and prescription drugs. The use of episode groupers could help support cost comparisons in these areas.

- Identification and pricing of treatment alternatives that may address the same medical need. For example, treatment of a specific condition may have pharmaceutical and surgical options. QCC would need to carefully explain how the consumer should consider the results provided through this feature to avoid the appearance of offering medical advice.

IV. Gap Analysis

A. Quality Gap Analysis

The table on the following page displays the areas beyond hospital and physician based care where quality measures could be included on the QCC web site in the future. These are divided into measures that have already been identified in the 2008 Reporting Plan as well as newer areas for investigation. Several population based quality measures from AHRQ and NCQA as well as Patient Experience measures from MHQP and the Medicare Health Outcomes Survey are recommended for review in order to determine and compare variations in quality by geographic region, gender and race/ethnicity. At times these comparisons would have to be at the state level and not the provider level given limited data that prevents reaching statistical viability at a lower level. Quality measures are also available from JCAHO, CMS and DPH for some provider types but none are currently available for dentists, podiatrists, psychologists and other licensed providers. There is no patient experience or disparities information currently available for any of the provider types listed. These can be areas for measure development in the future.

Gap Analysis	Previously identified			Other possibilities		
	Quality measures	**Patient experience**	**Disparities**	**Quality measures**	**Patient experience**	**Disparities**
Populations						
1. Community*	AHRQ PQIs 1-3, 5, 7-16; AHRQ PDIs 14-18; HEDIS Effectiveness of Care & Use of Services measures	MHQP Patient Experience Survey (PES) uses 5 geographic regions of MA	These measures could identify disparities by community	Age-adjusted mortality rates	None	These measures could identify disparities by community
2. Gender (M/F)	AHRQ PQIs 1-3, 5, 7-16; AHRQ PDIs 14-18; HEDIS Effectiveness of Care & Use of Services measures	Medicare Health Outcomes Survey	These measures could identify disparities by gender	Age-adjusted mortality rates	None	These measures could identify disparities by gender
3. Race/ethnicity	AHRQ PQIs 1-3, 5, 7-16; AHRQ PDIs 14-18; HEDIS Effectiveness of Care & Use of Services measures	Medicare Health Outcomes Survey; MHQP PES	These measures could identify disparities by race/ethnicity at the state level only	Age-adjusted mortality rates	None	These measures could identify disparities by race/ethnicity
Provider types						
1. Acute care hospitals	N/A					
2. Physicians	N/A					

Gap Analysis	Previously identified			Other possibilities		
	Quality measures	**Patient experience**	**Disparities**	**Quality measures**	**Patient experience**	**Disparities**
3. Subacute hospitals	None	None	None	JCAHO accreditation; CMS Nursing Home Compare; MA DPH SNF reports; flu vaccine among personnel (CDC); CMS Nursing Homes measures (16)	None	None
4. Chronic care hospitals	None	None	None	JCAHO accreditation; vaccine among personnel (CDC	None	None
5. Behavioral health hospitals	None	None	None	JCAHO accreditation	HBIPS measures could be required	None
6. Dentists	None	None	None	None	None	None
7. Podiatrists	None	None	None	None	None	None
8. Psychologists	None	None	None	None	None	None
9. Other licensed providers**	None	None	None	None	None	None
10. Hospice	None	None	None	NCI hospice care measures (comfortable dying, family evaluation of hospice care, cancer pts in hospice <3 days, cancer pts not admitted to	None	None

Gap Analysis	Previously identified			Other possibilities		
	Quality measures	**Patient experience**	**Disparities**	**Quality measures**	**Patient experience**	**Disparities**
				hospice, cancer pts getting chemo in last 14 days, cancer pts w/ED visit in last 30 days, cancer pts w/>1 hosp admit in last 30 days), NHPCO Quality Pledge; new measure: % pts who die in preferred location (Tom Lee); flu vaccine among personnel (CDC)		
11. Home Care	None	None	None	JCAHO accreditation; CMS Home Health Compare; vaccine among personnel (CDC	None	None
12. Dialysis facilities	None	None	None	CMS Dialysis Facility Compare; Natl Voluntary Consensus Stds for ESRD (27 measures); flu vaccine among personnel (CDC	None	None

Gap Analysis	Previously identified			Other possibilities		
	Quality measures	**Patient experience**	**Disparities**	**Quality measures**	**Patient experience**	**Disparities**
13. Ambulatory surgery center	None	None	None	JCAHO accreditation	None	None
Settings						
1. Inpatient	All derived from the above					
2. Outpatient facility						
3. Home						
*using the smallest areas of analysis that is statistically viable, i.e. by ZIP, 3-digit ZIP, municipality or county						
**ambulance services, social workers, chiropractors, acupuncturists, physical/occupational therapists, dental hygienists, dispensing opticians, optometrists,,						
EMTs, speech pathologists/audiologists, nurse practitioners, physician assistants, respiratory therapists, pharmacists and pharmacies, perfusionists, x-ray technicians						

B. Cost Gap Analysis

The table below displays the areas beyond hospital and physician based care where costs could be included on the QCC web site in the future. Several population based costs are recommended in order to determine and compare variations in costs by geographic area, gender and race/ethnicity. Beyond that, the median cost can be determined for a variety of provider types. However, at this time no measures exist for measurement of cost for chronic care hospitals and a variety of other providers including, ambulance services, social workers, chiropractors, acupuncturists, physical/occupational therapists, dental hygienists, dispensing opticians, optometrists, EMTs, speech pathologists/audiologists, nurse practitioners, physician assistants, respiratory therapists, pharmacists and pharmacies, perfusionists, and x-ray technicians.

Cost Analysis

	Previously Identified		**Other Possibilities**
Populations	**Cost Measures**		**Cost Measures**
1. Community*	None		Per member per month (pmpm) by community***
2. Gender (M/F)	None		Pmpm by gender***
3. Race/ethnicity	None		Pmpm by race/ethnicity***
Provider types			
1. Acute care hospitals	None		N/A
2. Physicians	None		N/A
3. Sub-acute hospitals	None		Median cost/day or avg. cost/stay
4. Chronic care hospitals	None		None; target for development of new measures
5. Behavioral health hospitals	None		Median cost/day or median cost/stay
6. Dentists	None		Median cost for variety of common dental services
7. Podiatrists	None		Median cost for variety of common podiatric services
8. Psychologists	None		Median cost for variety of services
9. Other licensed providers**	None		None; target for development of new measures
10. Hospice	None		Median cost per month or per patient

Cost Analysis

	Previously Identified		Other Possibilities
11. Home Care	None		Median cost per month or for variety of services
12. Dialysis facilities	None		Median cost per month (note: likely to be limited data due to Medicare coverage of most ESRD patients)
13. Ambulatory surgery center	None		Median cost for variety of common procedures

*by smallest areas of analysis that is statistically viable, i.e. by ZIP, 3-digit ZIP, municipality or county

**ambulance services, social workers, chiropractors, acupuncturists, physical/occupational therapists, dental hygienists, dispensing opticians, optometrists, EMTs, speech pathologists/audiologists, nurse practitioners, physician assistants, respiratory therapists, pharmacists and pharmacies, perfusionists, x-ray technicians

***Could be age-adjusted or, even better, severity adjusted (e.g., ACGs)

V. Review of the Display of the Council's Existing Website

A. Introduction

MHQP and its consultants have extensive experience in designing, developing and implementing websites containing health care quality and patient experience information targeted to consumers, including MHQP's own website (www.mhqp.org), and CMS' Hospital Compare website (www.hospitalcompare.hhs.gov*).* We have brought this expertise to the task of performing a systematic review of the recently launched MyHealthCareOptions site with particular focus on the presentation and display of measures included on the site, with consumers as the primary user.

1. List of Websites Reviewed

To approach this task we gathered information on existing websites from team members, DHCFP staff, colleagues in the field and a review of the internet. In all, we reviewed over 100 websites and articles about websites in this process. A list of these websites is included in Appendix J.

2. Criteria for Website Evaluation: Measure Presentation and Display

From our own experience and as a result of reviewing the websites listed in Appendix J, we distilled a list of criteria by which to assess the MyHealthCareOptions site. We developed a template including these criteria which team members used to provide feedback. This template is shown in Appendix K. The major categories included:

- Overall organization of information
- Welcome Page (home page)
- Other pages reached by a link or tab (including discussions of data sources, FAQ, and others)
- Organization of performance data (including explaining the importance of each measure, reporting of measures by category)
- Comparative reports for multiple organizations (use of benchmarks, use of internal comparisons)
- Content design including plain and clear language, format, and navigability

3. Sources of Criteria for Evaluation

Our decisions to use the above list of criteria were drawn from our own experience as well as articles, papers, sources obtained from colleagues, websites including AHRQ, and the

Department of Health and Human Services, Summary of Key Focus Groups Findings from December, 2007, DHCFP staff and Medullan. A list of sources appears in Appendix L.

4. Strategic Considerations

When designing a website it is important to enumerate the strategic objectives that one wishes to accomplish. Based on our discussions with QCC members and staff we determined the following strategic considerations to be used in reviewing the site.

- **Maintain a Consumer Focus**
  The foremost strategic consideration in assessing the MyHealthCareOptions site and making recommendations for improvement is the determination among all parties that the primary target audience is the consumer.

  Important secondary target audiences are providers and employers, who will be more likely to take action to improve their quality and costs if they believe that the information on the website is understandable by consumers.

  A tertiary audience is policymakers who may use information on the site as evidence to support policy initiatives and decisions.

- **Messaging**
  Given the prioritized target audiences, our recommendations are centered around presenting evidence-based quality and cost measures, with accompanying explanations, background, sources, and resources presented in plain language that can be understood at no higher than an eighth-grade level, in a clear and visually engaging display. The goal is helping consumers to recognize that quality and cost vary among providers and that, depending on the procedure required, high quality care can be received at lower costs.

- **Setting expectations**
  The consumer should understand that they can obtain

  - evidence-based quality and cost information for hospitals
  - information on hospital care for particular medical conditions or procedures
  - information on patient safety and patient experience in hospital care
  - comparisons of the above information among hospitals they choose
  - explanations of the sources of this information, why it is important, and how they can use it
  - information on the limitations of the information presented
  - links to other resources they may find useful

- suggestions for how to talk to their doctor about the information they see
- easy access to ways to provide feedback or ask questions about the site

- **Supporting QCC goals**
  Enhancing the MyHealthCareOptions site with a primary focus on the consumer and integrating the above list of expectations will support the Council's Goal (VI) to:

  "Promote quality improvement through transparency," specifically the development of a website and other materials providing comparative quality information."

  It will also help to achieve the other goals of the Council (to reduce the cost of health care; ensure patient safety and effectiveness of care; improve screening for and management of chronic illnesses; develop and provide useful measurements of health care quality; and eliminate racial and ethnic disparities in health) by increasing the awareness of the public and changing the behavior of other healthcare stakeholders.

B. General Evaluation of the Current Website Display

MHQP and its consultants recognize the considerable amount of thought and effort invested in the conception, testing and implementation of the MyHealthCareOptions website within a compact timeframe. Having designed the MHQP website, and participated in the design of the CMS' Hospital Compare site, we know the complexity of the task. We continue to update the MHQP site annually or more frequently in response to feedback we receive and the changing health care environment in Massachusetts. We have read and integrated feedback on MyHealthCareOptions from the initial focus groups and from test users from the Quality and Cost Council, Health Care for All and DHCFP staff which was provided by Medullan. In our recommendations we include some of the suggestions provided in this previous feedback and add others. Using the evaluation criteria described in the introduction to this section and in Appendix K the project team has reviewed the MyHealthCareOptions site.

1. What Works Well

We found that much of the current website works well. The MyHealthCareOptions site has incorporated many of the items that experts recommend and have included some details that are very useful and not found on most other sites. The table below lists the positive aspects of the site.

Welcome Page
• Uses attractive colors • Includes photographs • Effective use of subheadings and bullets • Lists several reasons for publishing the data and why one should look at this information. • Reasons are presented as questions rather than statements, which may resonate more with consumers (who are often in the position of asking questions) • Provides contact information on all pages except the measure pages
Other pages reached by a link or tab
• Provides additional information on measures and how calculated and what they mean on the detail page, and when one clicks on "more" on the summary page • Resource page is informative
Caveats or cautions that reader cannot assess a providers' overall performance by looking at a limited set of measures that reflect only some of the services they provide
• At bottom of "For Patients and Families page" has concise wording that says one should discuss this information with one's doctor. • Every organization listed is allowed to provide their own comments on their results on the website that can be accessed from their "Details" page • Has information about how to contact the hospital and go to its website

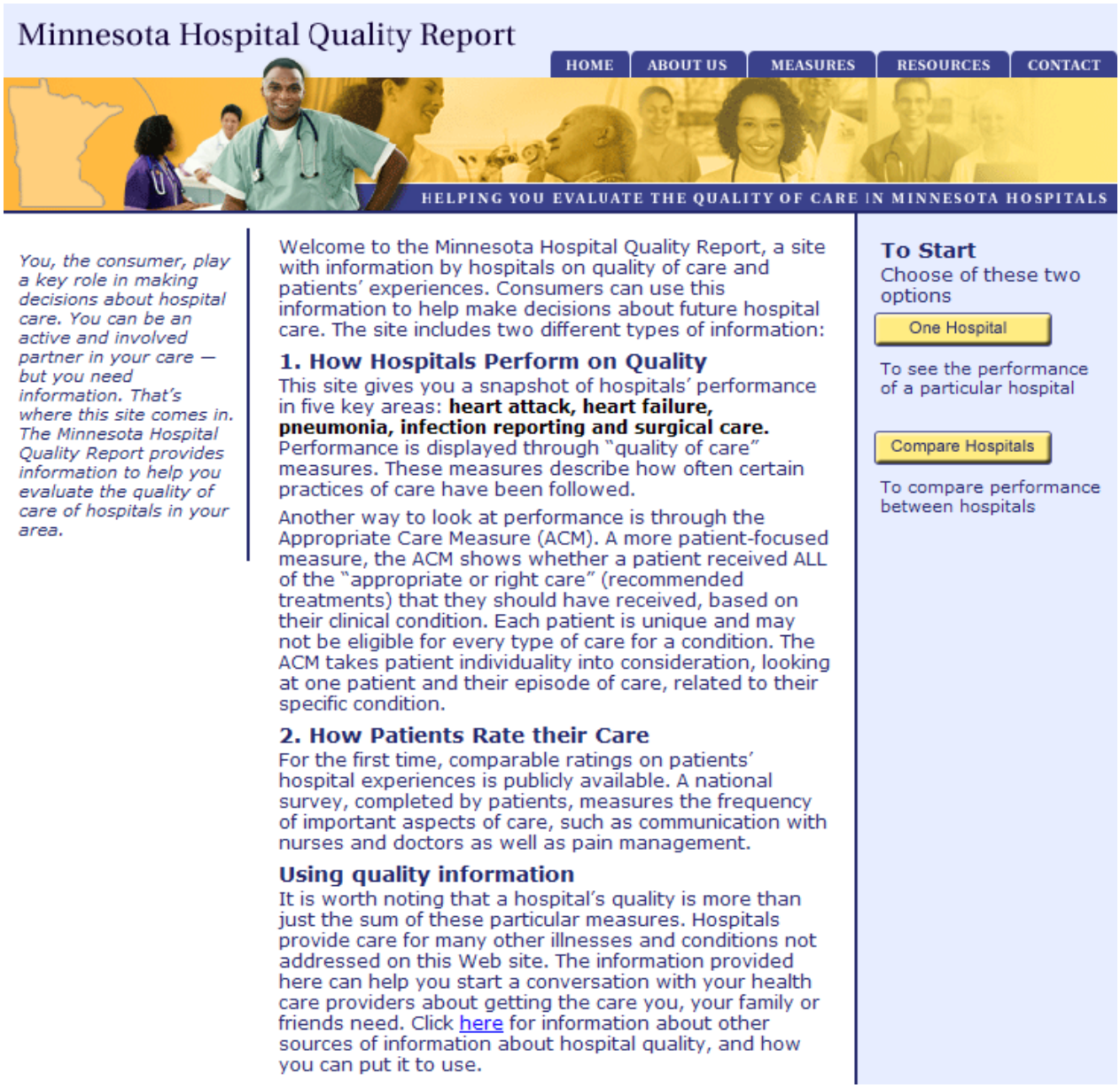
Level of information provided on measures and measure calculation
• Has detailed discussion of methods used, including statistical information, which can be reached via a tab rather than right on the page • Provides data sources and often links to those sources. About the Ratings' section, available as a tab on the top part of the Welcome Page, clearly describes the source of the data • Has FAQ section • Notes whether high or low score means better performance • Reports on each measure separately – sometimes on summary page and sometimes on detail page; has additional information on the measure when click on "more" • Adds number of patients and severity on the detail pages for a hospital • Has both cost and quality together where both exist • Organizes into categories that are listed clearly on the drop-down menu and on the bar on the left side • Compares to the state rate or average or median as well as the hospital's position within a percentile ranking • Details on statistics and methods are provided on separate page • Provides technical, more detailed information on a link
Content/Design
• Unavoidable medical language is explained on the page • Word use is consistent • Usually not much scrolling needed • Contact information is clearly labeled on each page except the measure pages • Uses standard page design and same symbols and icons throughout • Uses pull-down menus sparingly

2. What Works Less Well

While there is much to recommend in the MyHealthCareOptions *s*ite, as with all websites, there is always room for improvement. Often an outside evaluation can bring up areas of improvement that might not be obvious to those working so closely on the site, and provide further evidence to support changes and improvements which the original designers wish to implement. Below we have presented some of the major changes that we would recommend, along with examples from the QCC's site and other health care sites that illustrate the recommendation. A full listing of all of the recommended changes can be found in Appendix M**.** Additional examples of Best Practices for Quality and Cost Websites can be found in

Appendix N. Where color is used to indicate value in the examples below, varying symbols may be used instead.

- Minnesota Hospital Quality Report gives users information on quality data and how to use it in very simple terms on their website. The homepage also provides a very clear link to start using the tool to examine quality data on hospitals or to compare hospitals within the state.
- The photo and tagline are the elements that catch the reader's eye first on the MyHealthCareOptions homepage because it is at the top of the page, while the tool only occupies the bottom corner of the page. Virginia Health Information's website places the tool on the top and near the center of the webpage.




For Physicians & Providers
For Insurers & Employers
MyHealthCareOptions™
A Health Care Resource Provided by the Commonwealth of Massachusetts Health Care Quality and Cost Council
Mass.gov
For Patients & Families
About The Ratings
Frequently Asked Questions
Resources & Tools
About Us
Choose your healthcare with confidence.
This site will help you learn about the quality & cost of health care.
This website can help you answer questions such as:
My doctor sees patients at two hospitals. Which one should I use?
Would I get better care for this health problem at my local hospital or a large medical center?
How does this hospital compare to others for the treatment I need?
I pay for some of my health care. How can I get quality care at the best price?
Find and compare quality and costs at Massachusetts hospitals
Your Location
Health Care Provider
Medical Condition or Procedure
Find a hospital that is convenient to you by entering your location and a maximum distance you can travel.
Your City, County, or Zip:
Ex: 02139; Cambridge, MA
Search Within:
5 miles
find
Home
Patients & Families
About The Ratings
Frequently Asked Questions
Resources & Tools
About Us


FROM NUMBERS TO KNOWLEDGE
VHI
VIRGINIA HEALTH INFORMATION
HOME
ABOUT US
CONTACT US
SITE MAP
RESEARCHERS AND PROFESSIONALS
Virginia Health Information
FROM NUMBERS TO KNOWLEDGE
Google™ Custom Search
Search
2009
Heart Care Reports
Virginia's Home For
Cost, Quality, and Efficiency Healthcare Information
Health Insurance
Hospitals
Nursing Facilities and other Long Term Care
Physicians
"VHI's Long Term Care Consumer Guide is a must have for anyone looking for long term care."
CONSUMER GUIDES
Cardiac Care
Obstetrics
Virginia Hospitals
Health Insurance Options
Long Term Care
OBSTETRICAL SERVICES
Find Health Care Near You
Hospitals
Southwest | Central | East | North | Northwest
102 N. 5th Street | Richmond, VA 23219 | Phone (804) 643-5573 | Fax (804) 643-5375 | Toll Free 1-877-VHI-INFO (844-4636)
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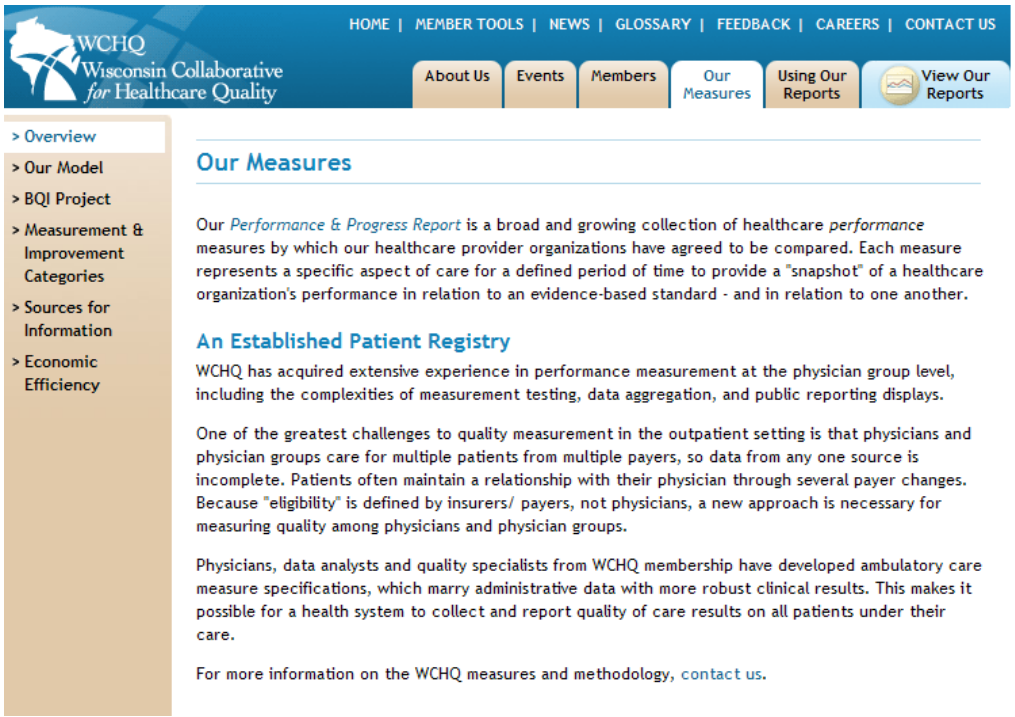
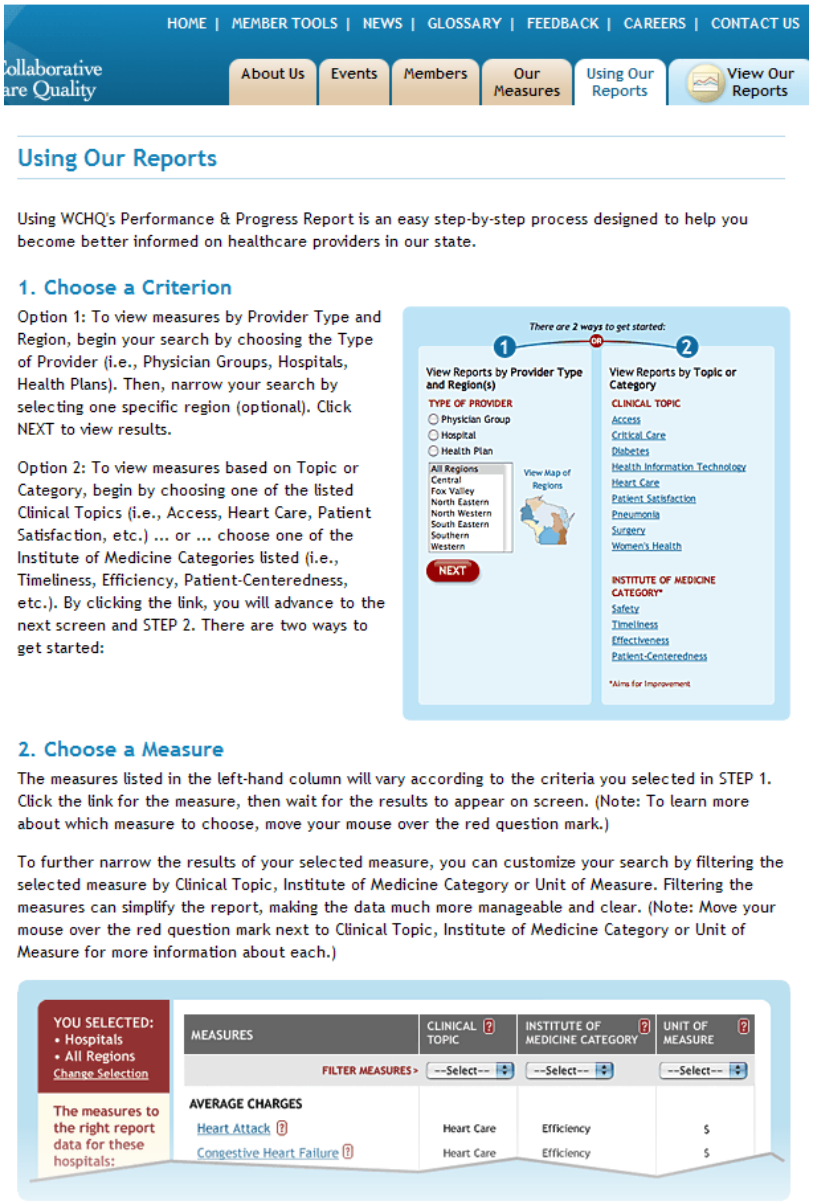
- The *About the Ratings* section of MyHealthCareOptions is a very long webpage that goes into detailed discussion of methods used in creating the reports. While this information is useful to have on the website, it may be too much detail for the average user, who would like to know how to use the report, and understand what the measures are reporting. The website for the Wisconsin Collaborative for Healthcare Quality has two tabs. *Our Measures* explains the measures and has a tabbed system down the left side of the page for navigating, which reduces the size of the page. *Using Our Reports* walks the user through the tool and how to use it, including defining how and why things are measured.





For Physicians & Providers | For Insurers & Employers

MyHealthCareOptions™

A Health Care Resource Provided by the Commonwealth of Massachusetts Health Care Quality and Cost Council

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For Patients & Families | About The Ratings | Frequently Asked Questions | Resources & Tools | About Us

About The Ratings

Start a New Search

Bookmark

About The Ratings

About The Ratings

The Massachusetts Health Care Quality and Cost Council (HCQCC) created this website by taking ratings from other recognized organizations and by calculating some new ratings from our own Massachusetts health care database. We have tried to make these ratings easy for patients to understand, and also useful to doctors, hospitals, policy makers, and others.

How did you choose the quality and cost measures for the website?

The HCQCC has adopted these principles to guide our work on the ratings:

Principles for Selecting Quality Measures

The Council shall use the following principles to select quality measures for public reporting through its website and other media.

1. Wherever possible, measures should be drawn from nationally accepted standard measure sets.
2. The measure must reflect something broadly accepted as meaningful to providers or patients.
3. There must be empirical evidence that the measure provides stable and reliable information, and that the data sources and sample sizes are sufficient for accurate reporting at the level chosen.
4. There must be sufficient variability or insufficient performance on the measure to merit attention.
5.
    1. There must be empirical evidence that the measured entity (clinician, site, group, institution) is associated with a significant amount of the variance in the measure. The measures offered for providers should, in totality, be representative of a significant proportion of their practices. OR
    2. The measure is important for patients or communities, even though a clear consensus on accountability for performance has not been determined.
6. Providers should be informed about the development and validation of the measures and given the opportunity to view their own performance, ideally for one measurement cycle, before the data are used for public reporting. Where feasible, providers should be permitted to verify data and offer corrections.

Principles for Selecting Cost Measures

1. The Council should publish a comprehensive and inclusive set of cost measures that reflect sufficient volume and relevance to be useful to an intended audience: consumers, employers, providers, insurers or policy-makers.
2. Cost measures should be accurate and reliable, and should be as timely as is feasible.
3. Cost measures should include the range of costs per procedure for an individual provider, as well as the most likely cost (median, mean or mode).
4. The Council should make efforts to display cost measures, to the extent possible, in ways that minimize harmful unintended consequences such as increased health care costs, collusion, introducing barriers to market entry, and other anti-competitive behavior.
5. The Council should display:
cost and quality measures that are closely aligned on the same page; cost measures that do not closely align with quality measures on separate pages; and quality measures that do not closely align with cost measures on separate pages.

This website is a work in progress. We will add new and updated data and ratings as soon as possible.

Here are some important things to know about our ratings.

Contact Information

Health Care Quality & Cost Council
2 Boylston Street, 5th Floor
Boston, MA 02116
Tel: 617-988-3360
Fax: 617-727-7662
hcqcc@massmail.state.ma.us

Where are the data from?

The HCQCC gets some of its data from established health care organizations that perform data collection and analysis. While the Council makes every effort to keep this data up to date, more recent data may be available on the organizations' websites. They include:

US Centers for Medicare and Medicaid Services (CMS), for hospital quality ratings on heart attack, heart failure, pneumonia, and surgical care.

The Leapfrog Group, for ratings of patient safety and quality for certain services (aortic valve replacement, weight loss surgery, and neonatal ICU care). Hospitals complete Leapfrog's patient safety survey based on their assessment of their own practices. Leapfrog uses this survey information to assess the hospital's patient safety practices.

The Massachusetts Division of Healthcare Finance and Policy, for a complete database of all hospital admissions in MA.

Massachusetts Department of Public Health's Data Acquisition Center (Mass-DAC) , for angioplasty and bypass surgery death rate and volume.

We also use our own database of healthcare services paid for by Massachusetts commercial health plans. This database includes the actual price paid by the health plan and the patient for the services provided.

Where are the quality measures from?

The HCQCC uses measures of quality that have been created by established organizations and are widely used. They include:

US Agency for Healthcare Research and Quality, for standardized measures of mortality

US Centers for Medicare and Medicaid Services for "process of care" measures, such as whether patients are receiving all needed care for their condition.

The National Quality Forum, which endorses measures of quality, safety and efficiency of care.

How is cost calculated?

The Health Care Quality and Cost Council calculated costs per case from our database of commercial health plan claims. Cost is based on the actual price that health plans pay hospitals. These are median dollar amounts meaning that half of the cases at this hospital cost more and half cost less. Costs are adjusted for severity of illness (how sick patients are).

Costs can vary a lot. Sometimes this happens even when patients are treated at the same hospital, by the same doctor, for the same condition. Your costs may be higher or lower depending on the specific services you receive.

To make fair comparisons among hospitals treating a variety of different patients, we adjust inpatient costs for how sick patients are, also called severity of illness. To do this, every patient claim in our database is rated for severity of illness on a scale of 1 (minor) to 4 (extreme). The claims are rated using APR-DRG (All Patient Refined-Diagnosis Related Groups) software by 3M Health Information Systems.

After each inpatient claim in the database is assigned a severity level, we calculate the average cost of caring for patients at each of the four severity levels across all hospitals in Massachusetts. Then, for each hospital, we calculate a predicted average cost for each severity level, based on the state-wide averages. We then compare the hospital's actual cost to the predicted average cost, and adjust for the difference. View an example of this calculation, Cost Calculation. The website displays is the adjusted inpatient cost per case. This shows a hospital's cost for treating a patient with average severity. Severity-adjusted inpatient cost allows consumers to compare costs at different hospitals, even though some hospitals treat more high-severity patients.

Cost Data Technical Information

Dates. The cost data is for services provided from 7/1/2006 through 6/30/2007, which were paid by 12/31/2007.

Diagnostically Related Groups (DRGs). Inpatient claims are grouped using 3M's All Patient Refined (APR-DRG) grouper software, version 24.

Cost. We show the cost of care as the "allowed amount" paid to the hospital. The allowed amount is equal to the amount paid by the health plan plus the amount due from the patient (such as a co-payment, deductible or co-insurance). Cost does not include payments for physician services. Claims with $0 payment were excluded from the analysis.

Transfer cases. Care for patients treated in one hospital and then transferred directly to another hospital is included in our data. Since the cost of care for one patient is split between two hospitals, we may underestimate the cost of care per case.

DNR (Do Not Resuscitate) cases. Some terminally ill patients may have a living will and may have "Do Not Resuscitate" orders so life-saving treatment will not be given to them if their heart stops or they stop breathing. From our database, we cannot tell which patients were "DNR" before their hospital stay. This may increase the apparent death (mortality) rate for some of the conditions.

Commercial health plan data. The HCQCC data covers about 2/3 of all privately insured Massachusetts residents. It includes all Massachusetts members of fully insured plans, plus all members in MA Group Insurance Commission (Commonwealth of Massachusetts employees, retirees and their beneficiaries) and Massachusetts residents enrolled in self-insured plans administered by Blue Cross and Blue Shield of Massachusetts.

Medicare and Medicaid. The Council's dataset does not include information about patient enrolled in Medicare, Medicaid or other public payers. Medicare and Medicaid payments are not included in the median costs displayed on this website.

Sources for Quality Data and Cost Data differ. The cost data are from commercial health plans only, while quality data may come from all patients treated at a hospital, or just the Medicare (mostly over age 65) patients. Therefore, the cost and quality data shown do not represent the same patients.

Minimum Sample Size. We display cost data for hospitals that had 30 inpatient discharges or 30 outpatient visits for the condition or procedure. We display summary ratings using dollar signs ($$$) for conditions and procedures where at least 10 Massachusetts hospitals provided at least 30 discharges or 30 visits.

Hospital Systems. Some hospital systems provide hospital care at more than one campus. We show measures for each campus when we have them. If we don't have information for each campus, we show information for the system. For example, we may have mortality information for each hospital campus, and cost information for the system as a whole.

How is Statistical Significance calculated?

We use significance tests to determine if a hospital's quality or cost is statistically *Above Average Quality* or *Below Average Quality*. Each test is performed at the 0.05 significance level. This means that there is only a 5% chance that the size of the difference could have occurred by chance.

Statistical Significance for Quality

Stroke, Hip Fracture, and Hip Replacement Mortality Rate Data
Heart Attack, Heart Failure, and Pneumonia Process of Care Data
For this data, we use chi-squared tests of independence to determine statistical significance. To use this test, we count the number of patients in each hospital and in the whole state that fall into the two patient outcome categories (for example, lived versus died). The data can be shown in a table with two rows and two columns. The chi-squared test of independence tests if a hospital's outcomes are significantly different from the state as a whole. For more information about this statistical method see the Handbook of Biological Statistics.

Angioplasty (PCI) and Bypass Surgery (CABG)
We use confidence intervals calculated by Mass-DAC to determine statistical significance.

Statistical Significance for Cost

Outpatient Costs
For outpatient costs, we use t-tests for the comparison of two means to determine statistical significance. To use this test, we compare each hospital mean to the statewide mean, taking into account the number of cases at each hospital and statewide and the standard deviations. For more information about this statistical method see the Agency for Healthcare Research and Quality (AHRQ).

Inpatient Costs
For severity-adjusted inpatient costs, we use a "bootstrap" approach to determine statistical significance. We use this bootstrap approach because no simple statistical significance formulas exist for the severity-adjusted inpatient cost measure.

To use this method, we construct "bootstrapped" 95% confidence intervals for the difference between each hospital's severity adjusted costs and statewide severity-adjusted costs, using the following steps:

1. We construct a bootstrapped sample of patient outcomes by randomly selecting with replacement patient outcomes from each hospital - the number of outcomes selected for each hospital is the hospital's original sample size.
2. Acting as if the bootstrapped sample were the actual data, we compute the severity-adjusted measure for each hospital and for the entire state.
3. We then calculate for each hospital the difference between the bootstrapped severity-adjusted measure for the hospital and for the state.

We repeat these three steps 1000 times, resulting in 1000 bootstrapped differences of severity-adjusted measures for each hospital.

4. Finally, we determine for each hospital the 2.5 and 97.5 percentiles of the 1000 differences. If both percentiles are above 0 then the hospital is labeled significantly *Above Average Cost*, and if both percentiles are below 0 then the hospital is labeled significantly *Below Average Cost*. All other hospitals are labeled *Not Different from Average Cost*.

For more information about this statistical method see Bootstrapping (statistics).

- The symbols and statistical significance on the MyHealthCareOptions site can be confusing to the user because the complete message sent by the combination of the two can seem contradictory. Providers could receive anywhere from two to three dollar signs and be labeled *below average cost,* while providers could receive from two to four stars and be labeled *not different from average quality.* Below are some examples of queries from the website.

Cost of Care: Chest X-Ray (more)

	Hallmark Health Systems - Lawrence Memorial Hospital	Hallmark Health Systems - Melrose Wakefield Campus	Lahey Clinic	Winchester Hospital
Cost Rating	$$	$$	$$$	$$$
Statistical Significance	Below Average Cost	Below Average Cost	Below Average Cost	Below Average Cost

Bone and Joint Care: Hip Fracture (Show Details)

Hip fracture treatment quality and cost varies by hospital. The reason to know about this is that someday you, or someone you care about, may need to decide which hospital to go to for hip fracture treatment. You can make a more informed choice when you know about quality and cost and then discuss this with your doctor.(more)

Diagnostic classification: Hip Fracture (APR-DRG 308)

Quality of Care (more)

	Hallmark Health Systems - Lawrence Memorial Hospital	Hallmark Health Systems - Melrose Wakefield Campus	Lahey Clinic	Winchester Hospital
Quality Rating	★★	★★★	★★★★	★★★
Statistical Significance	Not different from Average Quality	Not different from Average Quality	Not different from Average Quality	Not different from Average Quality

Heart Care: Heart Attack (Show Details)

Heart attack treatment quality and cost varies by hospital. The reason to know about this is that someday you, or someone you care about, may need to decide which hospital to go to for heart attack treatment. You can make a more informed choice when you know about quality and cost and then discuss this with your doctor.(more)

Diagnostic classification: Heart Attack (APR-DRG 190)

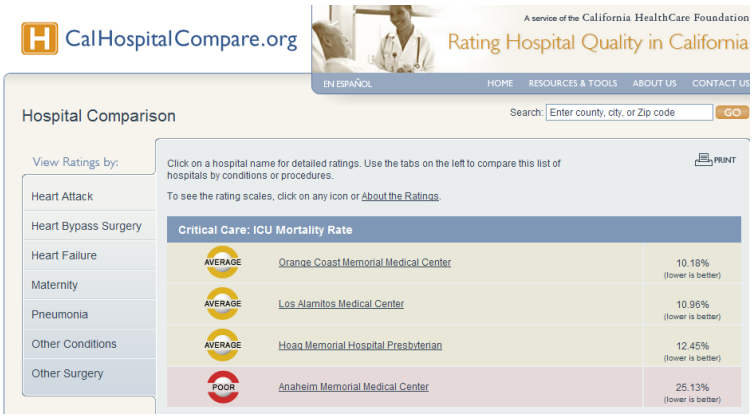
Quality of Care (more)

	Brigham & Women's Hospital	Caritas St. Elizabeth's Medical Center	Massachusetts General Hospital	Mount Auburn Hospital
Quality Rating	★★★★	★★★	★★★	★★★
Statistical Significance	Above Average Quality	Above Average Quality	Above Average Quality	Not different from Average Quality

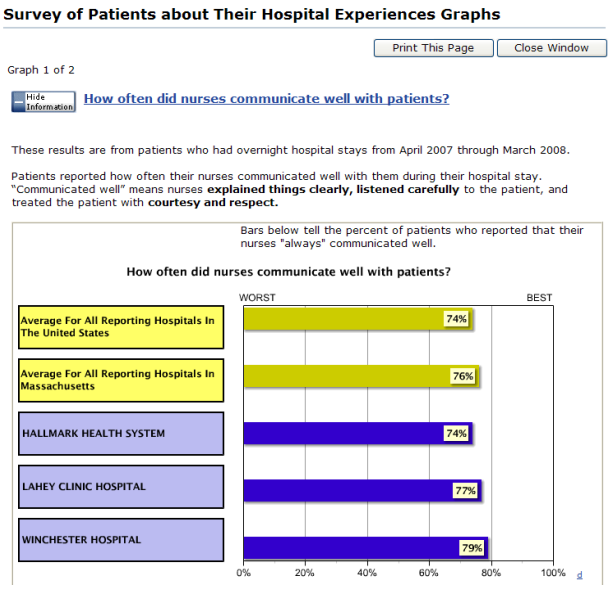
Cost of Care (more)

	Brigham & Women's Hospital	Caritas St. Elizabeth's Medical Center	Massachusetts General Hospital	Mount Auburn Hospital
Cost Rating	Data is available from too few hospitals to assign dollar sign ratings. See details.			
Statistical Significance	Above Average Cost	N/A	Above Average Cost	N/A

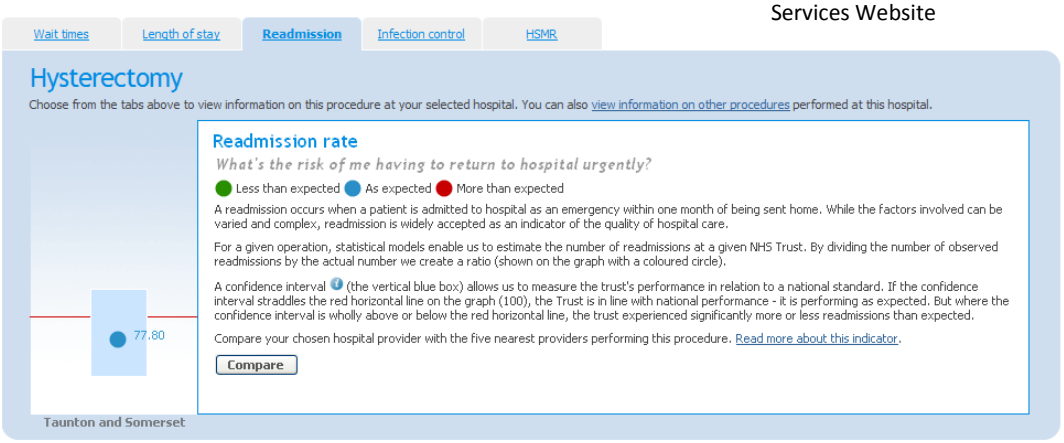
- Many websites use symbols to display the results of comparisons. CalHospitalCompare illustrates where the score given in a percentage is in comparison to the state average. The US Department of Health and Human Services' website HospitalCompare allows the user to see results in bar graph form, and compares it to the national and state averages. DrFosterHealth, an independent benchmarking website from the United Kingdom, uses a combination of colored symbols and a box representing the confidence interval that can be compared to hospitals in the area.



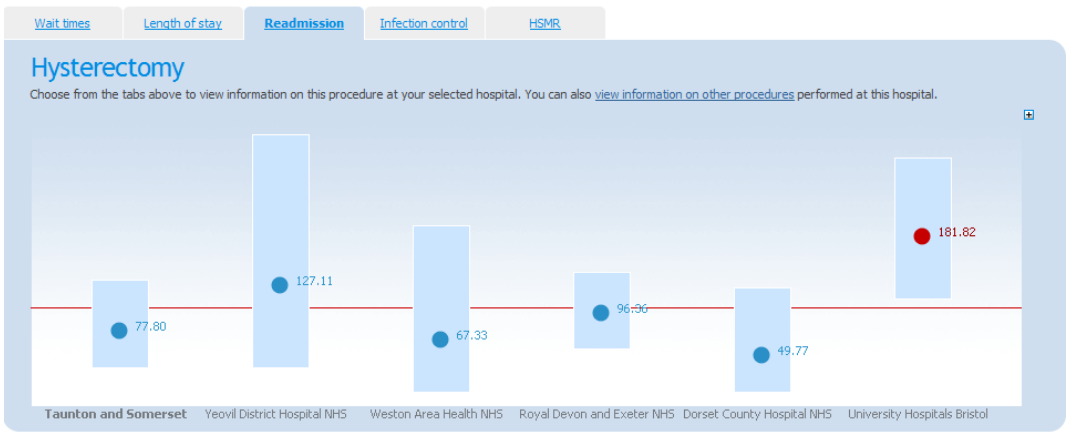
CalHospitalCompare - California HealthCare Foundation's Website



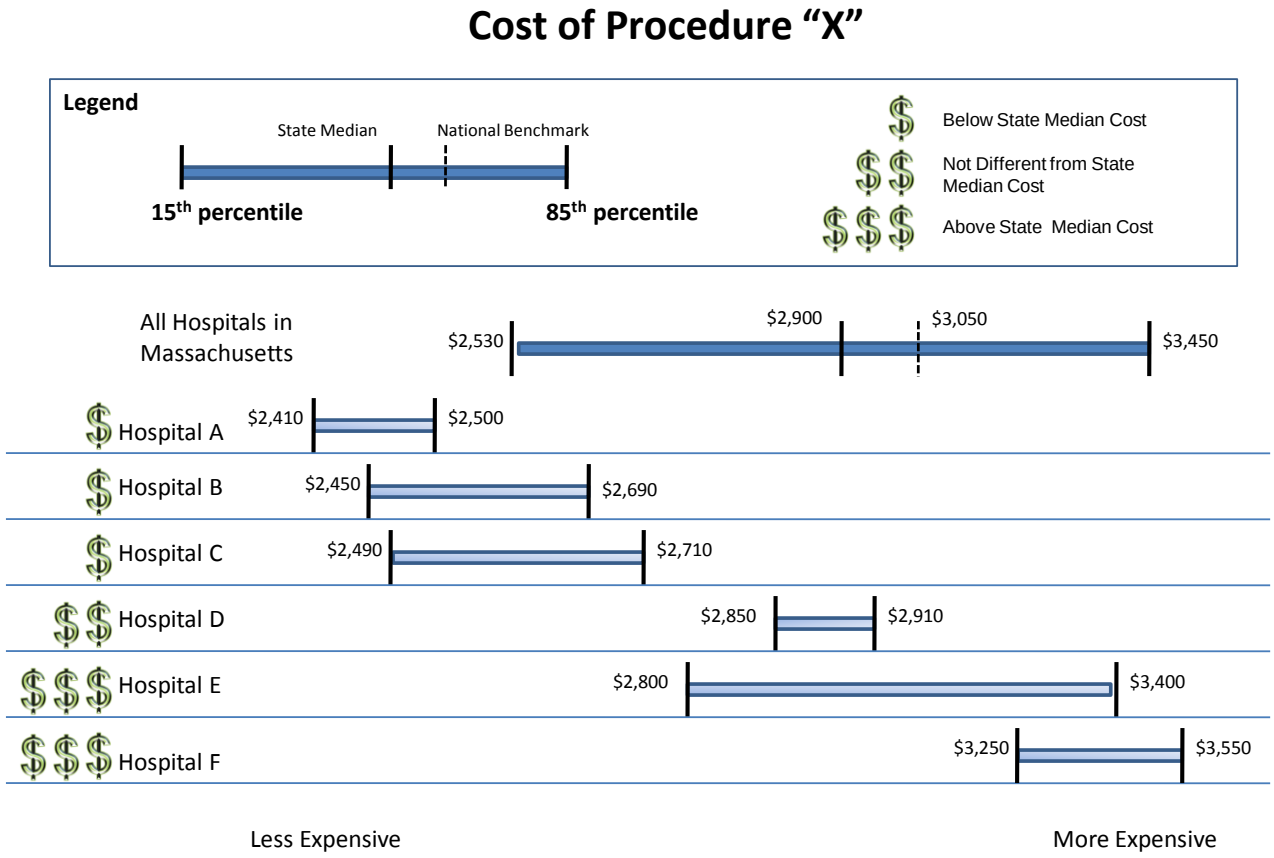
HospitalCompare - US Department of Health and Human Services Website



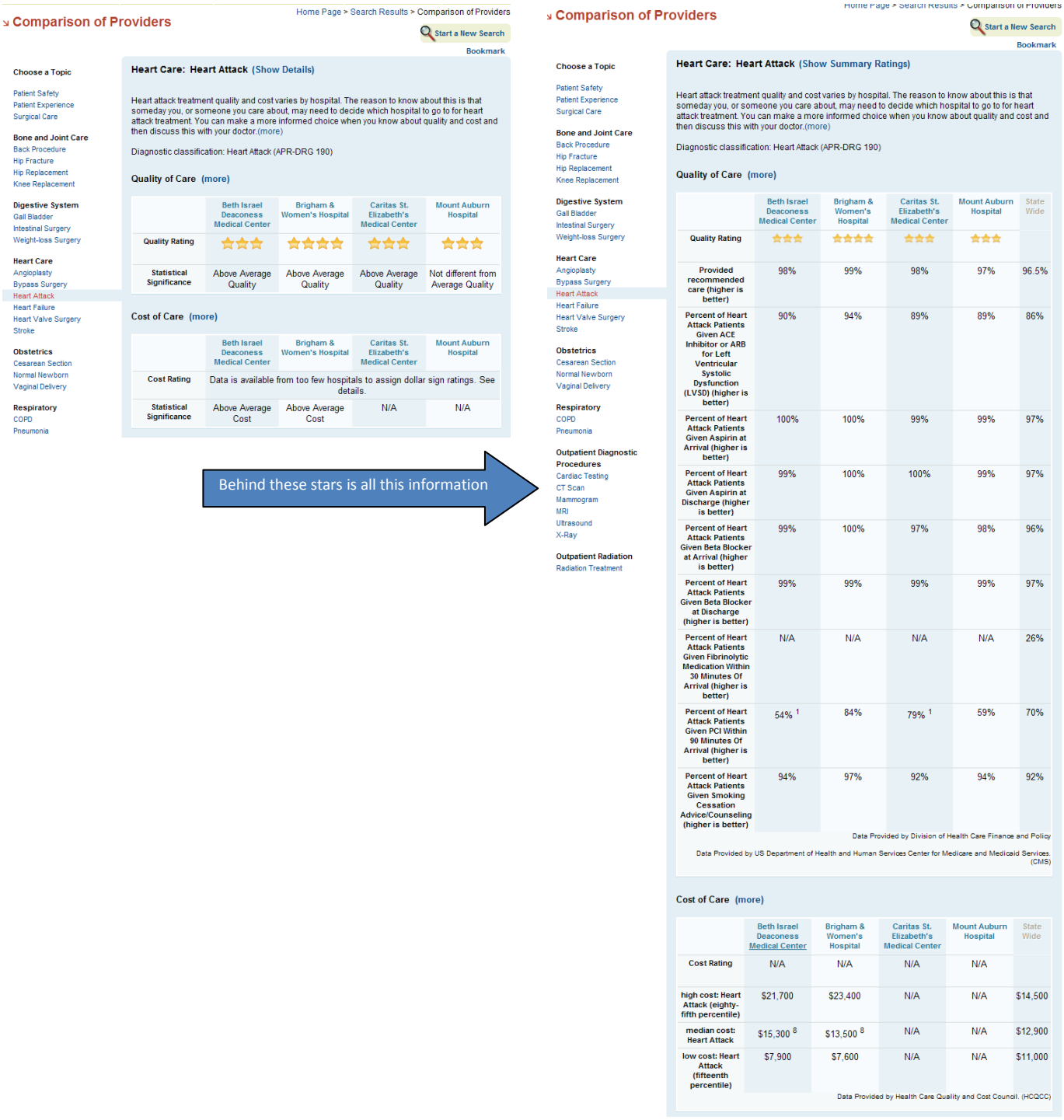
Dr.FosterHealth, the website of an independent United Kingdom health services benchmarking group. The bottom image appears on the webpage when the user clicks 'compare' in the top image.



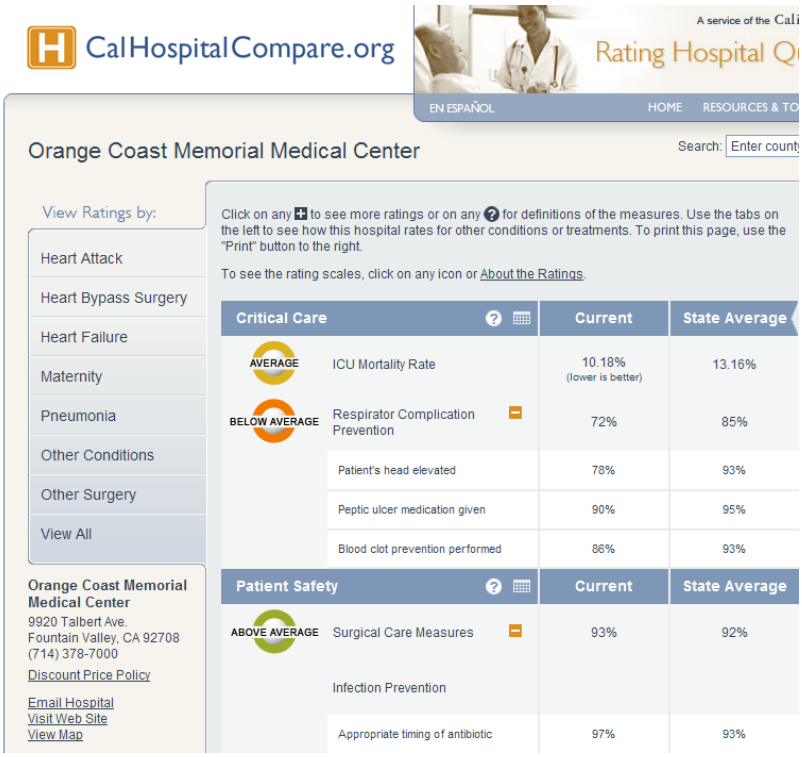
- We propose to develop a new rating system that is clearer for the consumer. The new system might use a bar chart for costs with a bar representing the 15th - 85thpercentile costs for each hospital compared to 15th - 85th percentile costs across entire state. By using this format, this chart displays only the **likely range of costs** a consumer could expect to pay at a given hospital. Ideally the site could be designed so that a consumer could move their mouse over a bar and the median value would appear.

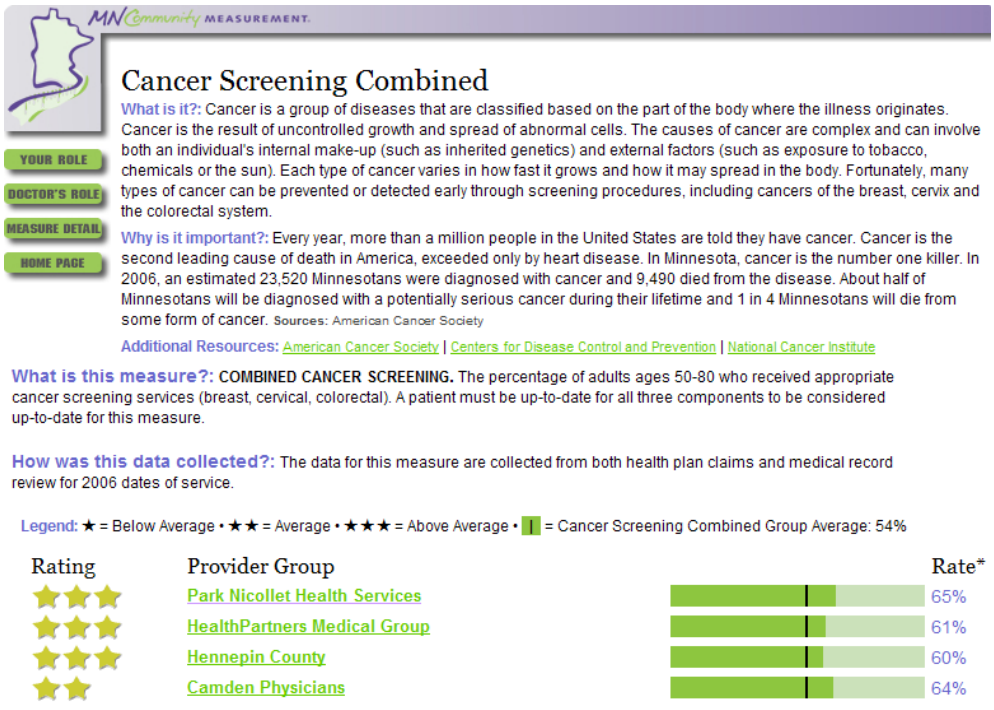


- Summary scores can be deceptive because the user is not sure what or how much information is used to award stars and dollar signs. For example, the measure for heart attack contains 9 sub-measures. It is unclear how the 9 sub-measures are used to create the final summary score. New ways of creating summary scores will be suggested in Task 2 of this project, along with ways to display the scoring process on the website.



- Other comparison websites have integrated symbols and data to appear on one page. Integrating on one page allows the user to see how the summary scores are compiled. CalHospitalCompare displays average ratings along with percentages. MNCommunityMeasurement gives the rating, the average, and compares with state benchmarks with one bar graph and stars.





- MyHealthCareOptions has a lot of cost information displayed on the detail page. The summary page does not have any cost data on it at all, besides the dollar signs, which have an entirely different meaning for each measure. Were median costs for all hospitals used to determine each $? How are they summarized? It is unclear to the user what the dollar sign is representing. NH Health Cost website displays estimates of what the user and an insurance provider may pay, as well as a precision rating of the cost estimate.

Detailed estimates for Colonoscopy (outpatient)

Procedure: Colonoscopy (outpatient)
Insurance Plan: Harvard Pilgrim HC, Health Maintenance Organization (HMO)
Within: 1000 miles of 03079
Deductible and Coinsurance Amount: $1,000.00 / 0%

Lead Provider Name	Estimate of What you Will Pay	Estimate of What Insurance Will Pay	Estimate of Combined Payments	Precision of the Cost Estimate	Typical Patient Complexity	Contact Info
BEDFORD AMBULATORY SURGICAL C	$1000	$82	$1082	LOW	MEDIUM	BEDFORD AMBULATORY SURGICAL C 603.622.3670
DUNNING ST AMBULATORY CARE CTR	$1000	$129	$1129	HIGH	LOW	
DARTMOUTH HITCHCOCK SOUTH	$1000	$232	$1232	MEDIUM	MEDIUM	DARTMOUTH HITCHCOCK SOUTH 800.238.0505
SPEARE MEMORIAL HOSPITAL	$1000	$265	$1265	VERY LOW	MEDIUM	SPEARE MEMORIAL HOSPITAL 603.536.1120
ALICE PECK DAY MEMORIAL HOSPITAL	$1000	$435	$1435	MEDIUM	VERY LOW	ALICE PECK DAY MEMORIAL HOSPITAL 603.448.3121
PARKLAND MEDICAL CENTER	$1000	$488	$1488	VERY LOW	MEDIUM	PARKLAND MEDICAL CENTER 603.432.1500
ST JOSEPH HOSPITAL	$1000	$610	$1610	MEDIUM	HIGH	ST JOSEPH HOSPITAL 603.882.3000
FRISBIE MEMORIAL HOSPITAL	$1000	$636	$1636	MEDIUM	HIGH	FRISBIE MEMORIAL HOSPITAL
ELLIOT HOSPITAL	$1000	$685	$1685	LOW	MEDIUM	ELLIOT HOSPITAL 603.669.5300
CONCORD ENDOSCOPY SURGERY CENTER	$1000	$690	$1690	VERY LOW	MEDIUM	
SOUTHERN NH MEDICAL CENTER	$1000	$771	$1771	MEDIUM	HIGH	SOUTHERN NH MEDICAL CENTER 603.577.2000
CONCORD HOSPITAL	$1000	$811	$1811	LOW	VERY HIGH	CONCORD HOSPITAL 603.228.7145
WEEKS MEDICAL CENTER	$1000	$878	$1878	MEDIUM	MEDIUM	WEEKS MEDICAL CENTER 603.788.4911

Lead Provider This is the single entity that all health care procedure costs are assigned to in HealthCost. Even when separate payments are made to a physician and a hospital, the estimated payment amount is the combined total amount paid. When a Lead Provider is not listed in the results, we do not have sufficient data to calculate an estimate.

Estimate of What You Will Pay – This figure represents out of pocket payments you may be required to pay based upon your health coverage, your deductible, and your coinsurance. Deductibles and co-insurance are paid after the service is provided.

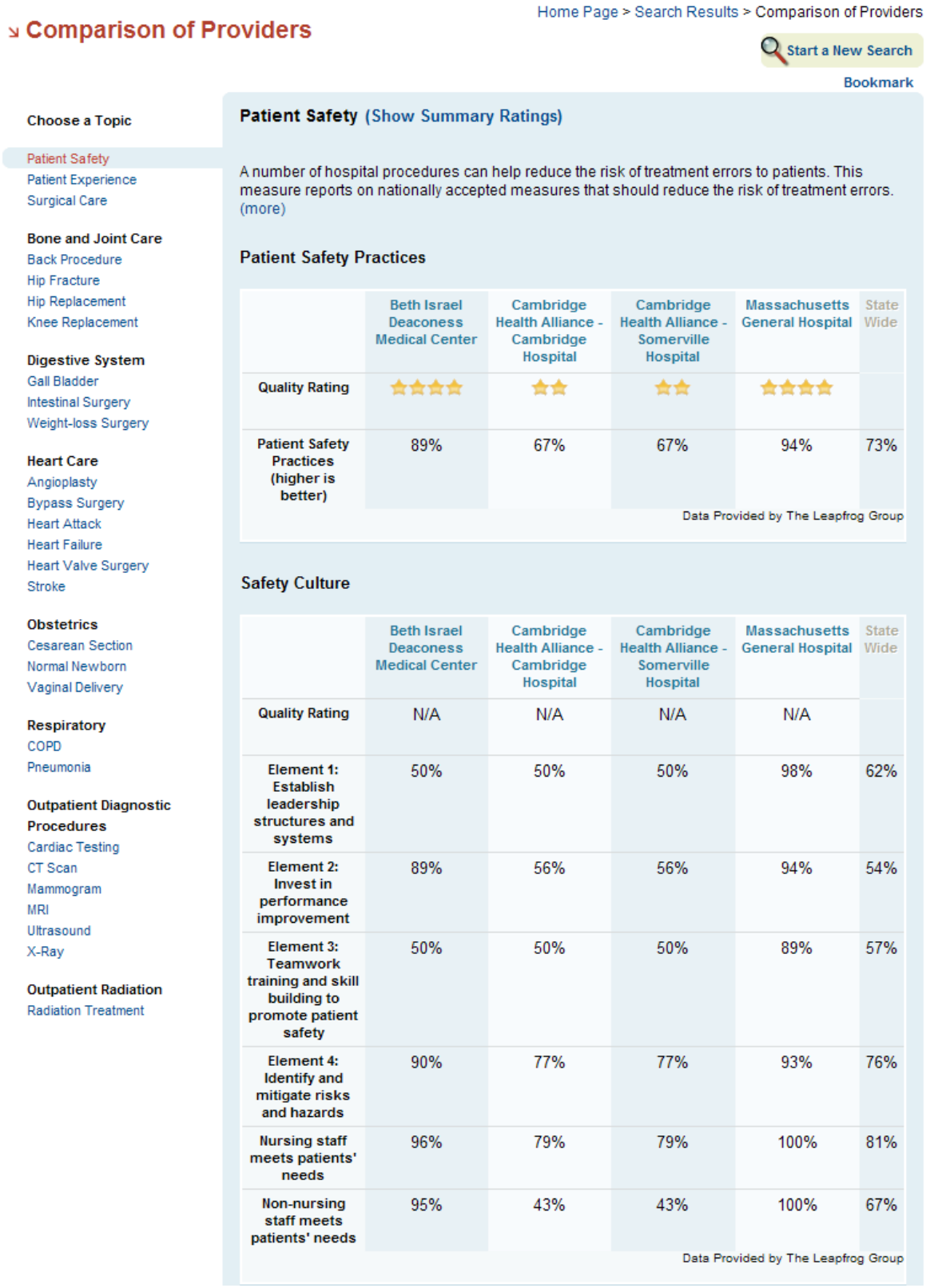
Estimate of What Insurance Will Pay – This figure represents the payment made by your insurance company to the health care provider.

Estimate of Combined Payments – This figure represents the combined amount that the health care provider receives from you as a patient and from your insurance company.

Precision of the Cost Estimate – This is an indication of how accurate, based upon statistical analysis and historical experience, the cost estimate is. A lower precision means that there is a greater likelihood that the amount of your bill will differ from the cost estimate. A high precision means that the amount of your bill will have a greater likelihood of being close to the cost estimate. Some estimates are more precise than others because the amount charged for the procedure across all patients is more uniform. When the amount charged for a procedure or services across all patients varies considerably, it is more difficult to estimate an expected cost for the procedure or service, and as result, the cost estimate is less precise.

Typical Patient Complexity – This is an indication of how healthy or sick the patients are that are seen for this particular procedure at this health care provider. Some health care providers see sicker patients, or patients that are more complex, and thus there may be more costs associated with treating them.

- State or regional benchmarks can be useful to a consumer or other user who is trying to understand the scores of hospitals. Though state averages are currently displayed on the MyHealthCareOptions website, they are not obvious, and could be displayed in a way that is more useful to the user.



Comparison of Providers

Home Page > Search Results > Comparison of Providers

Start a New Search

Bookmark

Choose a Topic

- Patient Safety
- Patient Experience
- Surgical Care

Bone and Joint Care

- Back Procedure
- Hip Fracture
- Hip Replacement
- Knee Replacement

Digestive System

- Gall Bladder
- Intestinal Surgery
- Weight-loss Surgery

Heart Care

- Angioplasty
- Bypass Surgery
- Heart Attack
- Heart Failure
- Heart Valve Surgery
- Stroke

Obstetrics

- Cesarean Section
- Normal Newborn
- Vaginal Delivery

Respiratory

- COPD
- Pneumonia

Outpatient Diagnostic Procedures

- Cardiac Testing
- CT Scan
- Mammogram
- MRI
- Ultrasound
- X-Ray

Outpatient Radiation

- Radiation Treatment

Patient Safety (Show Summary Ratings)

A number of hospital procedures can help reduce the risk of treatment errors to patients. This measure reports on nationally accepted measures that should reduce the risk of treatment errors. (more)

Patient Safety Practices

	Beth Israel Deaconess Medical Center	Cambridge Health Alliance - Cambridge Hospital	Cambridge Health Alliance - Somerville Hospital	Massachusetts General Hospital	State Wide
Quality Rating	★★★★	★★	★★	★★★★	
Patient Safety Practices (higher is better)	89%	67%	67%	94%	73%

Data Provided by The Leapfrog Group

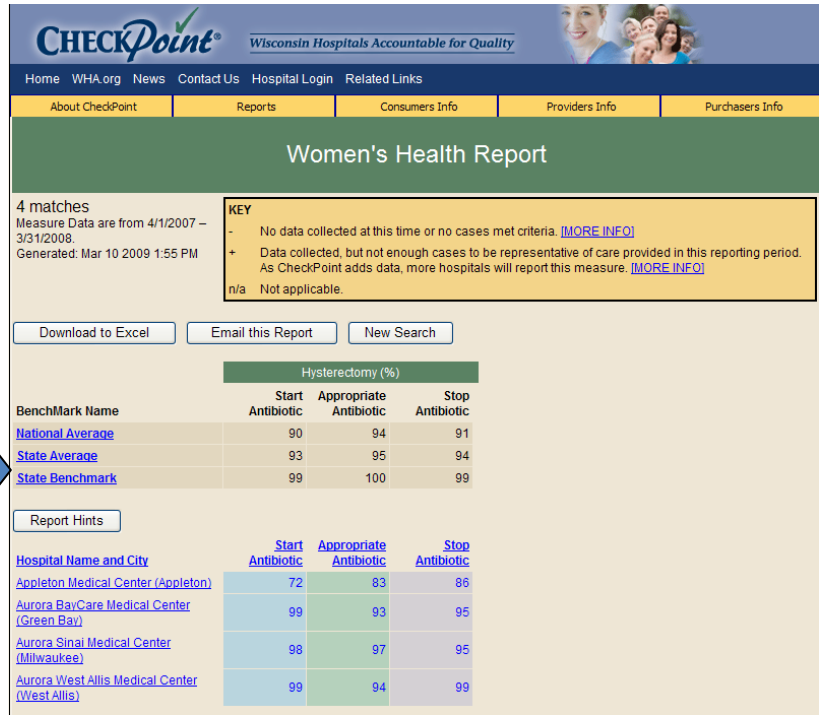
Safety Culture

	Beth Israel Deaconess Medical Center	Cambridge Health Alliance - Cambridge Hospital	Cambridge Health Alliance - Somerville Hospital	Massachusetts General Hospital	State Wide
Quality Rating	N/A	N/A	N/A	N/A	
Element 1: Establish leadership structures and systems	50%	50%	50%	98%	62%
Element 2: Invest in performance improvement	89%	56%	56%	94%	54%
Element 3: Teamwork training and skill building to promote patient safety	50%	50%	50%	89%	57%
Element 4: Identify and mitigate risks and hazards	90%	77%	77%	93%	76%
Nursing staff meets patients' needs	96%	79%	79%	100%	81%
Non-nursing staff meets patients' needs	95%	43%	43%	100%	67%

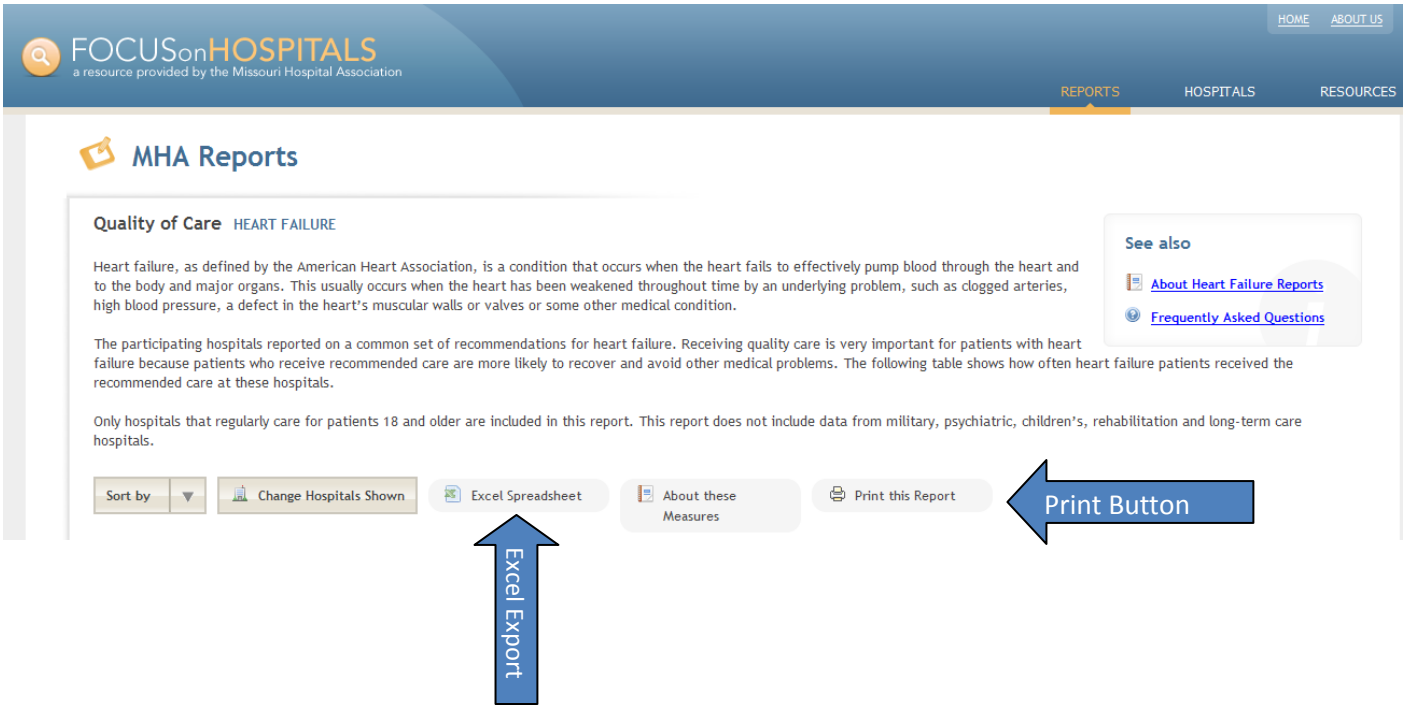
Data Provided by The Leapfrog Group

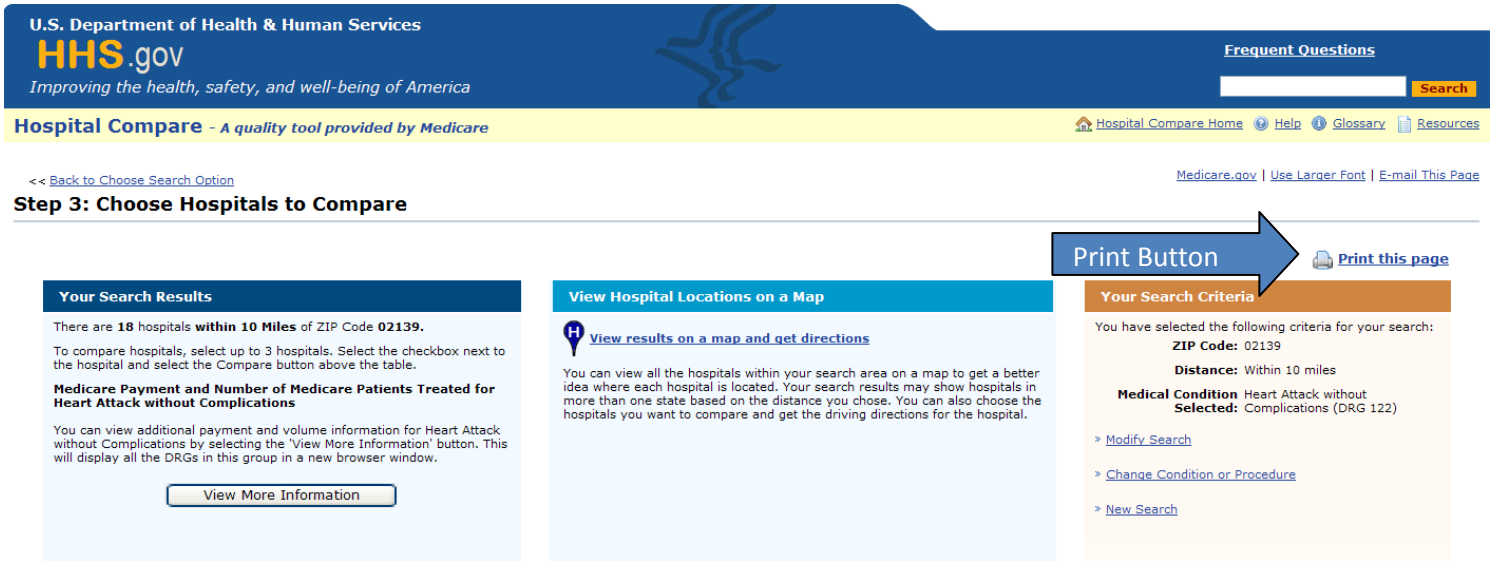
- FocusonHospitals and WiCheckpoint allow the various target audiences to compare hospitals with the national average, state average, and state benchmarks.

National and State Benchmarks

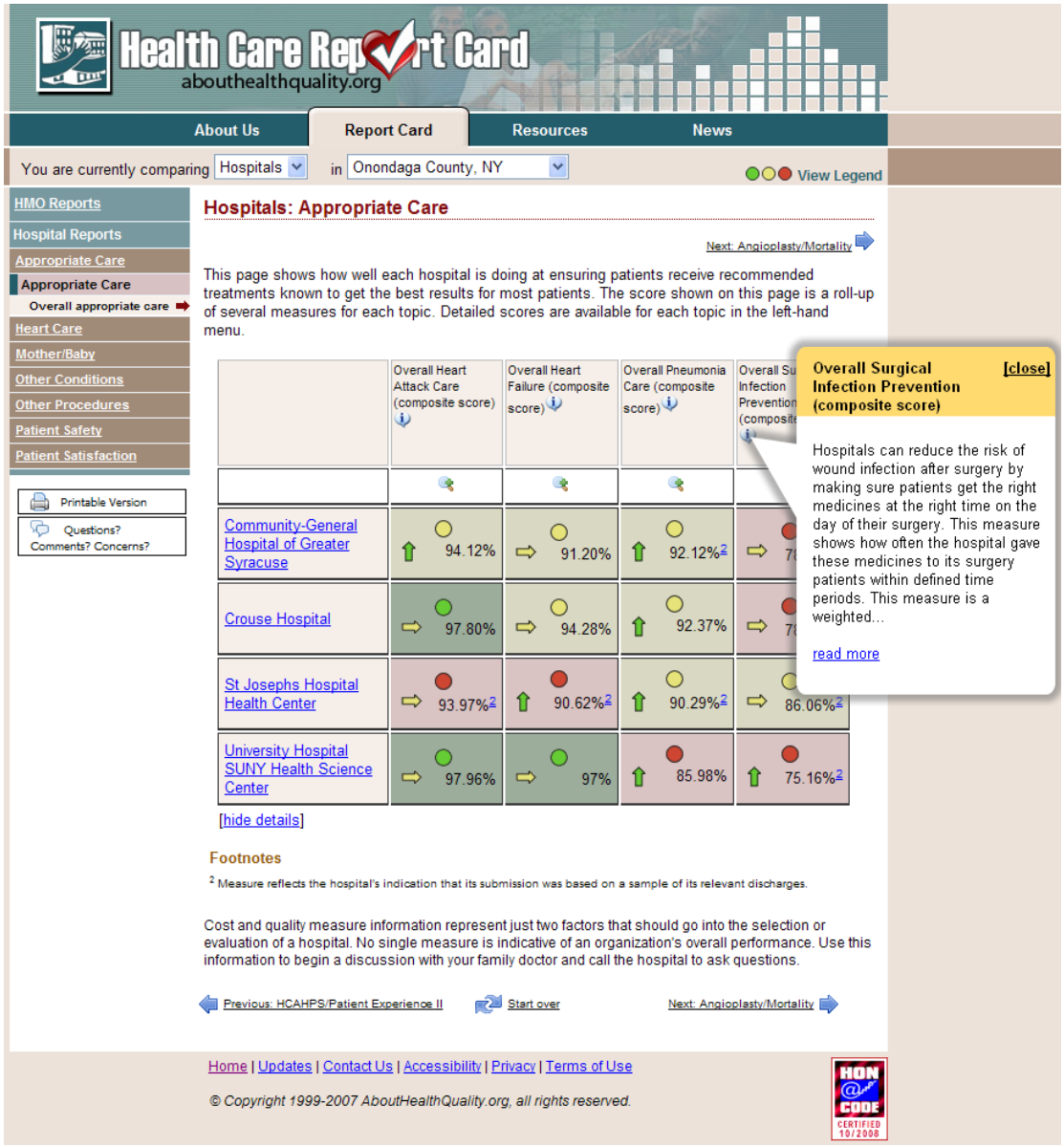


- Many websites give motivated users the ability to convert the comparison results into something that they can use to further analyze, or that they can easily print for use when talking with family members or doctors. FocusOnHospitals allows users to export to an Excel spreadsheet or print the report using a printer-friendly version. HospitalCompare also has a printer-friendly report button.





- To learn more about the measures listed on the MyHealthCareOptions website, the user clicks on the 'more' button. This not only gives the user information on what the measure is, but how quality and cost are measured. Though this system works well, we recommend considering the use of on screen bubbles or boxes so user does not have to navigate away from the results page for definitions of measures. On abouthealthquality, a website for New York State and the surrounding region, an onscreen bubble opens when the user clicks on 'info' button. The below example could be adapted by using varying symbols rather than color to represent different values.



VI. Methodological Issues and Recommendations Relevant to the QCC Website

Over the course of our review of the current QCC website, analysts at MHQP and Milliman have noted five methodological approaches of particular importance to the clear and accurate presentation of quality and cost data. The issues we reviewed include the following:

- Use of Mean or Median to Compare Cost Results
- Minimum Sample Size for Reporting a Measure on Website
- Benchmarks for Quality and Cost Measures
- Methods for Calculating Summary Measures for Quality
- Displaying Rankings vs. Statistical Significance on Website Summary Page

A summary of our recommendations on each issue is presented below, followed by tables with the pros and cons of each option.

1. ISSUES WHERE WE CONCUR WITH THE QCC METHODS

A. Use of Mean or Median to Compare Cost Results

Providers, in most cases, receive a range of payments for a given procedure. It is therefore helpful to determine a specific cost point that can be used to compare one provider's costs to other selected providers and/or to a statewide benchmark. Both means and medians can be good statistics to use in this case.

- ***We are recommending the QCC continue to use medians.***
    - Medians minimize bias related to data base anomalies and outliers since they are less influenced by a small number of data points.
    - Medians also are more helpful to consumers because they are more likely than mean values to approximate the dollars associated with a typical paid claim.
    - Consumers can readily understand the notion that half of the claim paid amounts will be lower and half will be higher than the displayed amount.

B. Minimum Sample Size for Reporting a Measure on Website

Using an accepted minimum sample size for reporting results helps to ensure that the results will reliably represent the performance of a provider and distinguish real differences in performances among providers. The ideal minimum reliable sample size can vary based on numerous issues.

- ***We recommend that the QCC continue with its current decision to establish a minimum sample size specific to each measure set, using a recognized conventional minimum where one exists***.

2. ISSUES WHERE WE CONCUR WITH THE QCC'S METHODS BUT RECOMMEND EXPANSION

A. Benchmarks for Quality and Cost Measures

Benchmarks provide a reference to help the consumer assess the quality or cost of a particular provider beyond direct comparisons with other individual providers.

- ***We recommend the use of at least two benchmarks for both quality and cost measures***.
    - For quality we recommend the QCC continue to use one benchmark based on the average of all of the results for the entire Massachusetts population included in a given measure and add one benchmark based on the 85th percentile score within the state. Ideally a third external benchmark, such as a national or New England regional rate, should be included if it is available.
    - For cost measures we recommend the QCC continue to use the statewide median provider cost and a within-state regional provider-level median cost. A national rate also should be included if appropriate.

B. Methods for Calculating Summary Measures for Quality

There are a wide variety of methods that can be used to summarize results on individual quality measures in order to form a broader statement about the performance of a given provider.

- ***We recommend that the QCC continue to use the Summary Compliance Rates (sum of component measure numerators/sum of component measure denominators) for the data currently on the QCC website.***
    - The Summary Compliance Rate is referred to as the "Opportunities" approach and is used by The Joint Commission and CMS.
    - In addition to being used by several national sources, the method is transparent and easily understood. While missing data can affect Summary Compliance Rates, the current hospital measures have little missing data.

- ***For a few specific areas of measurement, where all applicable services are clearly rendered to the same patient in the same facility for the same condition or procedure, we recommend the use of the percent of patients in compliance on all applicable measures as the preferred method***.

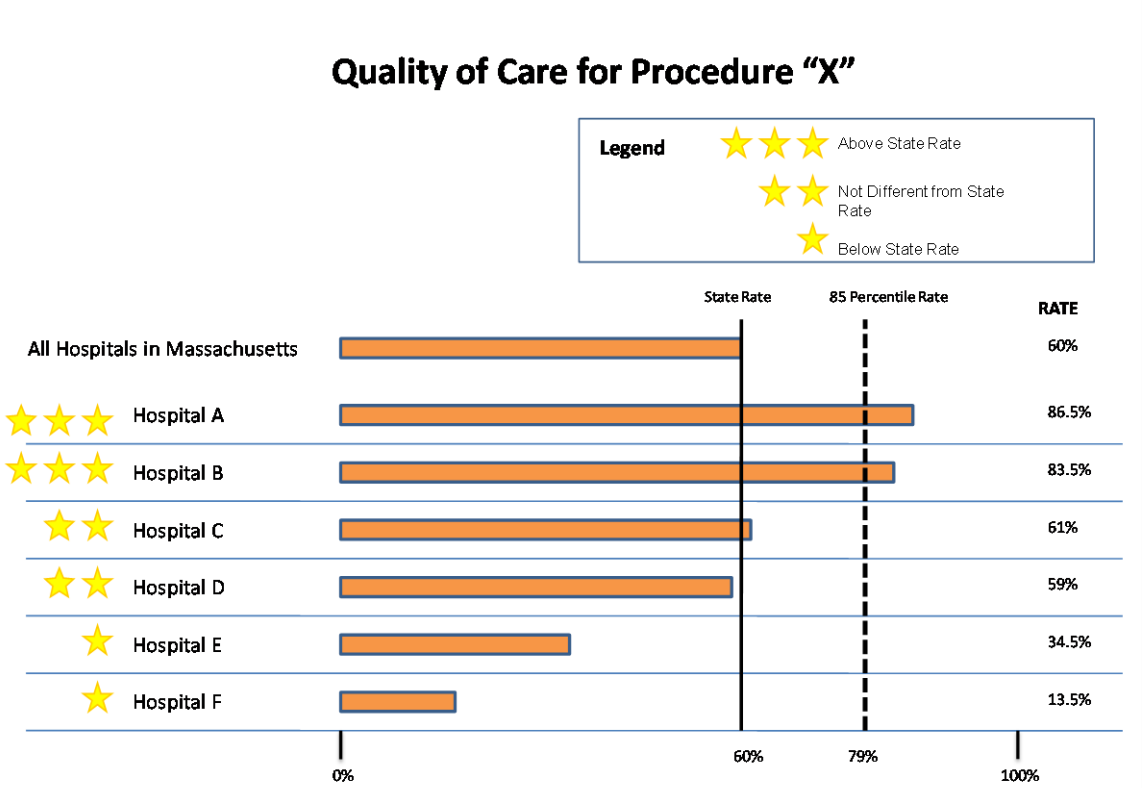
3. METHODOLOGICAL ISSUE WHERE WE RECOMMEND REVISIONS

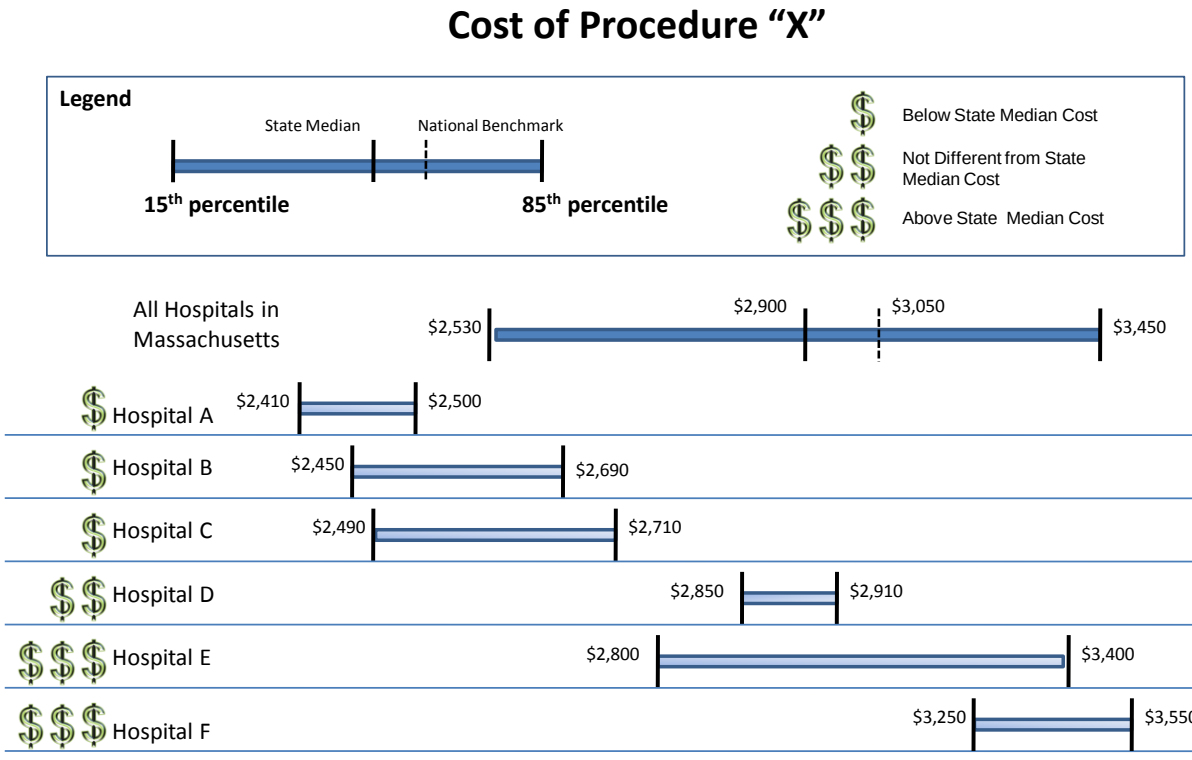
A. Displaying Rankings vs. Statistical Significance on Website Summary Page

Options for displaying summary results include the use of rankings and/or statistical significance. The purpose of a summary page is to give the viewer a quick sense of the relative performance of different providers. Since ranks and statistical significance can deliver contradictory measures, displaying both can defeat that purpose and result in confusion for the consumer.

- ***We recommend using only statistical significance.***
- ***We further recommend that the statistical significance be displayed with 1 – 3 stars for the quality metrics and 1 – 3 dollar signs for cost metrics where the symbols represent performance that is below average, not different from the average, and above average.***
    - For quality measures, the stars should be accompanied by the actual score which could be displayed as a bar on a bar chart.
    - For cost measures, the dollar signs should be accompanied by either the median cost or the 15^{th} to 85^{th} percentile costs, with costs displayed as a bar graph that shows the 15^{th} percentile cost on the left end of the bar and the 85^{th} percentile cost on the right end of the bar.
- ***Finally, we recommend the QCC consider having the display show the best performers (above average for quality and below average for cost) at the top of the chart, followed by the average performers, with the lowest performers last.***
    - Within each category, providers should be listed in order of performance with the best at the top.
    - For example all hospitals with above average scores on a quality indicator should be listed in rank order at the top of the chart, followed by the average hospitals in rank order and the below average hospitals in rank order (see examples below).

Example of Displaying Statistical Significance of Quality and Cost Scores





Analysis of Pros and Cons of Options to Address QCC Website Methodological Issues

Benchmark Options for Quality Measures

OPTIONS	PROs	CONs
State population based rate	• Compares a given provider to the score received for MA as a whole (adds numerators and denominators for one measure across all providers) and provides a framework for evaluating any one provider's score.	• Numerators and denominators may not be available if measure results are not created internally by operations vendor.
Statewide average provider-level score	• Easy to calculate if numerators and denominators are not available from external source.	• Larger providers and smaller ones are given equal weight. Where there are more small (or more large) providers, the results may be skewed.
Statewide weighted average provider-level score	• Provides a result closer to the state population based rate than an unweighted average.	• Difficult to create if some providers' results are based on a sample and others are based on total caseload • Not feasible if measure numerators and denominators are not available
Statewide median provider level score	• Transparent methodology • Consumer can see if provider of interest is above or below the middle score	• Does not by itself give the range of scores. If a provider is at the 51st percentile level or at the 99th percentiles level is not known.
Best score among all providers in the state	• Shows distance between best score and the score of the provider of interest • Shows what is possible to obtain	• Sets a very high bar which, while appropriate as a target for quality improvement, should not be used for determining statistical significance and assigning ratings • Might not take into account the difference in complexity of cases at a given provider and the best provider
85th percentile score among all providers	• Transparent methodology • Consumer can see if provider of interest is above or below the middle score	• Might not take into account the difference in complexity of cases at a given provider and the 85th percentile level.

Benchmark Options for Quality Measures (continued)

OPTIONS	PROs	CONs
	• Shows distance between a score met or exceeded by only 15% of providers and the score of the provider of interest • Shows what is possible to obtain	• If provider is below this score cannot tell the degree of "deficiency", i.e., if they are at the 84th or the 24th percentile.
Appropriate Benchmarks of Care (ABC) (average of top decile performers' scores adjusted for small sample size)	• Transparent methodology but more complex than a simple percentile level • Shows distance between best scores and the score of the provider of interest • Shows what is possible to obtain • Useful for quality improvement by providers	• Sets a very high bar, which, while appropriate as a target for quality improvement, should not be used for determining statistical significance or assigning ratings • Might not take into account the difference in complexity of cases at a given provider and the best provider
National benchmarks	• Provides a larger framework. If a provider appears to be doing very well compared to others in the state but providers in MA are doing poorly compared to the nation, consumers, providers and policy makers should know this. • If a consumer does not have the option to select one of the highest quality providers based on these scores, which could happen for a variety of reasons, and if providers in MA overall are doing much better than others in the nation, it would be helpful for consumers to know this fact.	• Could be difficult to obtain.
NE regional benchmarks	• Provides a larger framework. If a provider appears to be doing very well compared to others in the state but providers in MA are doing poorly compared to providers in New England or the Northeast,	• Could be difficult to obtain.

Benchmark Options for Quality Measures (continued)

OPTIONS	PROs	CONs
	consumers, providers and policy makers should know this. • If a consumer does not have the option to select one of the highest quality providers based on these scores, which could happen for a variety of reasons, and if providers in MA overall are doing much better than others in the region, it would be helpful for consumers to know this fact.	

Recommendation: At least two benchmarks should be given for quality measures – one at the population average level and one at the 85th percentile. Ideally an external benchmark should be included as well. The population average should be used to determine statistical significance and assign star ratings.

Benchmark Options for Cost Measures

OPTION	PROs	CONs
Statewide average provider-level rate	• Easy to calculate if measure results are obtained from external source.	• Larger providers and smaller ones are given equal weight. Where there are more small (or more large) providers, the results may be skewed the result. (Outlier issues)
Statewide weighted average provider-level rate	• Provides a result closer to the state population based rate than an unweighted average.	• Difficult to create if some providers' results are based on a sample and others are based on total caseload. Still have outlier issues.
Statewide median provider level score	• Transparent methodology • Consumer can see if provider of interest is above or below the middle score	• Does not by itself give the range of rates. Whether a provider's rate is at the 51st percentile level or at the 99th percentiles level is not known.
Within-state regional median benchmarks where possible	• If consumers wish or need to select a provider in a certain geographic region, they can easily see how well each is doing compared to others in the same region.	• If a given region has higher costs, consumers may select among the high cost providers rather than between them and lower cost providers in other regions.

Recommendation: At least two benchmarks should be given for cost measures – one at the statewide median provider level score and one at within-state regional level, where possible. Ideally a third national benchmark should be used if available.

Use of Mean or Median to Compare Cost Results

OPTIONS	PROs	CONs
Mean cost	• Useful for public policy and research since, combined with the number of cases, can help calculate the total amount of dollars per case in a category • Allows for easier assessment of the statistical significance • Helps mask the rates of any one payer in that the mean may not necessarily represent the paid claim amount of specific claim.	• Not as useful for consumers since the mean is likely to be higher than what most patients and insurers paid for a given procedure • Claim data distributions do not typically follow a normal (bell-shaped) distribution and are likely to have long tails of large claim amounts with the mean value greater than the median. Without detailed analysis of the data by type of claim it may be difficult to estimate the relationship between the mean and the most "typical" amount paid • Means, in comparison to medians, can be significantly influenced by a small number of outlier or exceptional values. In some cases these outliers may be a result of anomalies or errors in the data set and should be eliminated from the analysis. This would require more detailed study of the data than may be reasonable given resource limitations.
Median cost	• Is preferable to means for minimizing bias related to data base anomalies or outliers since medians are less influenced by a small number of data points. • More helpful to consumers because median is more likely than a mean value to approximate the dollars associated with a typical paid claim since half the claim paid amounts will be lower and half will be higher.	• Since the median represents an actual amount paid, and 1 plan pays the majority of all claims, it is more likely to represent that plan's rate than that of any other payer. • Providers who are paid less than the median may attempt to negotiate for higher rates, which could result in overall increased costs. • Tests for statistical significance of medians are more problematic and less understood by individuals who are not statisticians • The median alone, may deceive consumers as it does not indicate that there can be a large range of actual costs they might experience
Cost range	• Allows consumers to see the variation in paid claim amounts at	• Giving a range without the median will prevent consumers from seeing the basis

Use of Mean or Median to Compare Cost Results (continued)

OPTIONS	PROs	CONs
(15th percentile to 85th percentile)	any selected facility • Allows consumer to see how paid claim amounts overlap between facilities • A hospital with a particularly high or low range would visually stand out in a graphical display.	for scoring different providers

Recommendation: Use medians and 15th and 85th percentile cost range

Minimum Sample Size for Reporting a Measure on Website

OPTION	PROs	CONs
Use customary minimums for a given measure set, e.g. 30 for ambulatory care, per NCQA HEDIS - 45 for office based patient experience, per MHQP, CG-CAHPS	• Conventional agreement • Easy to implement	• For some few measures an n below the conventional minimum would produce reliable results and providers will not be included that could be • For some measures significantly greater n's are needed and by using conventional minimum, the results are not stable. These providers will be misclassified.
Determine appropriate minimum for each measure within a measure set	• Would include all provider results that reach an accepted level of reliable at the measure level and therefore can be confidently displayed and compared on a public website	• Very difficult to calculate. • Requires significant research dollars.

Recommendation: Establish minimum sample size for each measure set, using recognized conventional minimum where one exists.

Displaying Rankings vs. Statistical Significance on Summary Page

OPTIONS	PROs	CONs
Percentile Rankings only	• Clearly makes distinctions among providers • Methodology if described clearly is understandable to consumers	• May make distinctions among providers that are not real but result from sample size, data quirks, and/or decisions made at the cut points that misclassify the position of a provider.
Statistical Significance only	• Represents distinctions among providers that are likely to be real and unlikely to be due to random error.	• May be less understandable to consumers, particularly if using medians rather than means for a score. • Likely to result in less ability to make distinctions among providers • Depends on the sample size, so small sites will have overly conservative results--high likelihood of missing a bad or good result.
Both	• Meets need to make clear distinctions among providers while allowing distinctions to be tempered by inclusion of information on whether the score is significantly different from the average. • Where both techniques distinguish among providers in the same way, the consumer is given a clear message about which providers perform well.	• Very confusing to consumers who do not understand the subtleties of measurement. The rankings can show differences among 3 providers that the statistical significance negates. • Situations where there is insufficient data to do the rankings but statistical significance is shown (or vice versa) can befuddle consumers. How can there be a real difference among the groups but no ranking?

Recommendation: For quality metrics, use statistical significance displayed as 1 – 3 stars and the actual score displayed as a bar graph. For cost metrics, use statistical significance displayed as 1 – 3 dollar signs and the median cost or the 15th to 85th percentile costs displayed as a bar graph (see examples on page 71).

Methods for Calculating Summary Measures for Quality

See Appendix O for the definitions of the options below

OPTIONS	PROs	CONs
Summary Compliance Rate	• Transparent • Used by both CMS and Joint Commission so would produce consistent results if QCC calculated measures itself or if it used the CMS and JACHO Results. • Allows for measure results with lower Ns that could not be displayed at the individual measure level to be included in the summary if n of denominators across measures reaches the minimum level.	• Sensitive to missing measures • Sensitive to relative denominators (e.g. hospital A does relatively more "hard" opportunities and B does more "easy" opportunities.) • Difficult to calculate overall reliability
Weighted Average Compliance Rate	• Transparent	• Sensitive to missing measures • Weights may be subject to politicized debate
Weighted Average Adjusted Compliance Rate	• Handles missing data in a sensible way	• Weights may be subject to politicized debate
Average Patient Compliance Rate	• Transparent	• Requires patient data, which is unavailable for most measures • Sensitive to the percent of patients with "hard" problems (failure of realism) • Sensitive to relative denominators

Methods for Calculating Summary Measures for Quality (continued)

OPTIONS	PROs	CONs
Percent of patients in compliance on all applicable measures	• Helps to ensure that providers follow each patient closely in all relevant areas	• Requires patient data, which is unavailable for most measures. • Very sensitive to patients with complex conditions or hard problems (extreme failure of realism)
Percent of Possible Points Earned	• Good for pay for performance formulae	• Some lack of transparency • Sensitive to missing data
Model-based methods	• Best handling of missing data • Most accurate answers	• Extreme lack of transparency • Requires patient data, which is unavailable for most measures.

Recommendations:

Summary Compliance Rate This method is recommended for the data currently on the QCC website as it is used by several national sources and is transparent. In addition for these hospital measures, missing data is not a significant issue.

Percent of Patients in Compliance on All Applicable Measures This method is recommended for a few specific areas of measurement, where all applicable services are clearly rendered to the same patient in the same facility for the same condition or procedure.

VII. Conclusions and Next Steps

Areas of best practice

Overall we have found much to admire in the QCC's first attempt to create a public website designed for consumers to learn about the cost and quality of health care provided in the Commonwealth of Massachusetts. In particular, we found that most of the quality measures displayed on MyHealthCareOption*s* reflect nationally endorsed measures that have broad stakeholder support and meet the Quality and Cost Council's Principles for Selecting Quality Measures. Most of the surgical procedures are elective, giving consumers an opportunity to seek the type of information displayed on the website. Similarly, most of the medical conditions are chronic, so that consumers may plan ahead by educating themselves about their condition and where the best care may be obtained. Several of the procedures are high risk procedures that may prompt more consumers to shop around for the best care available.

We also found that the MyHealthCareOptions website exhibits several important strengths in its display of cost information. Its use of paid claim data rather than billed charge data provides a more meaningful basis for hospital comparisons, since charges, in many cases, can be significantly above actual payment levels for a procedure. Its explanation of statistical methods for calculations is better than most sites. Its use of risk adjusted side-by-side hospital comparisons makes for easy review and its specification of a minimum sample size of 30 cases before display of findings supports more appropriate, statistically-significant comparisons.

In terms of appearance, we found that the MyHealthCareOptions site has incorporated many of the items that experts recommend and have included some details that are very useful and not found on most sites. The Welcome Page uses attractive colors and photographs and lists several reasons why consumers should look at this site. Importantly, the site reports on both cost and quality results, where both results exist and provides details on how the measures are constructed, including statistical information. It also notes whether a high or low score means better performance and gives other details that can help the consumer understand the costs involved, including the number of patients and severity of illness for a given hospital.

Recommendations for improvements

While there is much to recommend in the MyHealthCareOptions *s*ite, as with other websites, there is always room for improvement. In the area of quality metrics we identified the following modifications that would help make the site more effective.

- The current measure set includes some quality measures that have not received national endorsement.

- Some of the current quality measures do not reflect the highest priority medical conditions or procedures in terms of consumer interest, disease burden, opportunity for quality improvement or cost containment, or reduction of racial/ethnic disparities.

- Alternative sources exist for some measures that are more comprehensive, more timely, or less costly than some of those currently used.

- There are some obvious gaps in the conditions and procedures for which performance data are displayed on the website. Most notably, there are no quality measures of pediatric or maternity care.

- Currently, there are no quality measures for outpatient care. The "fit" between the high volume outpatient procedures for which cost information is displayed and those for which related quality measures are available is poor.

Disparities in Hospital and Ambulatory Quality of Care

- There is an abundance of evidence that racial and ethnic disparities in care delivery exist across a wide range of care settings, conditions and procedures. Almost every condition or procedure currently displayed on the QCC website has some evidence of a disparity at the national level or in recently published literature. For each opportunity, we have provided an estimate of the level at which data on either the measures or the delivery system would need to be aggregated in order to illustrate these disparities. In some cases, a bundled measure may permit analysis of potential disparities at the hospital level, while in others for an individual measure of care we might need to be aggregated at the community or regional level. Because health plans have only begun to collect self-reported data on patients' race and ethnicity the QCC database from which ambulatory care quality measures may be derived does not currently contain these data. Based on the assumption that self-reported data will need to be supplemented for a number of years before a critical mass of data are available to support disparities measurement, the ability to measure quality in the ambulatory setting include the management of chronic disease and preventive care services at the regional or community level.

  Based on our assessment, we have identified several areas for improvements in cost measures:

  - Providing cost ranges, such as at the 15thth and 85th percentile costs, rather than just the median. In some cases, procedure costs will vary considerably and this would help give the consumer greater insight on potential costs.

  - Adding a capability for users to enter their insurance information and receive a more precise cost estimate.

  - If legally possible, adding self-insured employer and multi-employer claims to the database.

- Comparing Massachusetts hospitals to national benchmarks to allow consumers to better understand the significance of high or low costs of Massachusetts hospitals within a broader context.

- Providing more sophisticated analytical tools to enable users to "drill down" further into the components of costs as well as display findings graphically.

Some of our recommendations for improving the display of the website include:

- Adding a section on "what is quality" and "what is cost"

- Being clear on what summary scores represent

- Fixing inconsistencies between symbols and language around statistical significance

- Allowing users to create a complete report about a hospital's performance

- Adding tools that allow easier navigation of the site

Methodological Recommendations

Finally, our recommendations on methodological issues of particular importance to the clear and accurate presentation of quality and cost data – some of which concur with the QCC's current approach and some proposing expansion or revision to their approach:

- Continuing to use medians instead of means to compare cost results

- Continuing with QCC's decision to establish a minimum sample size specific to each measure set, using a recognized conventional minimum where one exists

- Using at least two benchmarks for both quality and cost measures

- Continuing to use the Summary Compliance Rates (sum of component measure numerators/summary of component measure denominators) for the data currently on the QCC website

- For a few specific measure areas, where all applicable services are clearly rendered to the same patient in the same facility for the same condition or procedure, using the percent of patients in compliance on all applicable measures as the preferred method

- Using only statistical significance instead of rankings on the website summary page

- Displaying statistical significance with 1-3 stars for the quality metrics and 1-3 dollar signs for the cost metrics, representing performance that is below average, not different than average, and above average.
- Having the display show the best performers (above average for quality and below average for cost) at the top of the chart, followed by the average performers, with the lowest performers last.

Next Steps

This report presented the work completed on the first task required under the Massachusetts Health Care Quality and Cost Council contract with Massachusetts Health Quality Partners and its partner, the Milliman Corporation. The overall purpose was to review the quality and cost measures included in the QCC's 2008 Reporting Plan and the display of the measures selected from that plan on the QCC's website.

In the next phase of this project MHQP will be detailing the cost and quality measures that should be added to the site over the next three years. For the coming year, our focus will be on indentifying new measures in the area of hospital inpatient and outpatient care and physician based ambulatory care, and providing specifications for those measures.

VIII. Appendices

A. Hospital Inpatient Quality Measures

B. Disparities Analysis – Hospital

C. Ambulatory Quality Measures

D. Disparities Analysis – Ambulatory

E. Costs Prepared by Milliman, Inc.

F. Cost Website Characteristics and Capabilities

G. Cost and Utilization Databases

H. Data Analysis Tool Capabilities

I. Cost Data Groupers

J. Sources of Criteria for Evaluation

K. Evaluation Form for Health Care Quality Websites

L. List of Websites Reviewed for Quality Measures

M. Website Review – Recommendations for Areas of Improvement

N. Examples of Best Practices for Cost and Quality Websites

O. Definition of Summary Measure Methodologies